FIREARMS IN AMERICAN HISTORY

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A Home of Ancient Arms *Frontispiece*

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IN
AMERICAN HISTORY

1600 to 1800

BY

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As the Sawyer collection of firearms lacked a number of pieces necessary to illustrate this work, application was made to several other collectors for permission to photograph arms in their collections. To Messers MARK FIELD, CHARLES D. COOK, DR. J. B. THORNTON, W. A. LAWRENCE, J. M. SCRAFFORD, *and* FRANCIS R. BANGS, *grateful acknowledgment is made for their exceeding kindness, courtesy, and generosity.*

THE COLONIAL PERIOD

(1600 to 1775)

The Influence of Firearms

The Colonists in America were the greatest weapon-using people of that epoch in the world. Everywhere the gun was more abundant than the tool. It furnished daily food; it maintained its owner's claims to the possession of his homestead among the aboriginal owners of the soil; it helped to win the mother country's wars for possession of the country as a whole. These facts alone raise the interesting questions of what the Colonists used for weapons and where they got them. Further, the ultimate outcome of all strife between the Colonists and other people was victory for the Colonists. While the Colonists may have been excellent fighters, operating in the main upon home ground, and while their wars with other white people were side issues of European wars and to a considerable extent dependent upon the outcome there, it is nevertheless a fact that a war is composed of two factors, only one of which is the combatants themselves. Every war and every battle is made of

two factors: the strength, experience, and skill of the combatants have much to do with the issue; also so do the weapons with which they destroy each other.

An investigation of the firearms of the early struggles in America yields various results. Besides the simple and direct one of rejuvenating a long lost knowledge are others of greater importance. Firearm makers of old were men of surprising ingenuity and artistic skill. Ingenious solutions of problems in form, balance, decoration, boring, grooving, throating, disposition of parts, mechanisms for turning, stopping, locking and unlocking, present to the inventor of to-day bases upon which to build again. Ornamentation by means of form, chiseling, engraving, embossing, openwork, gilding, inlaying with gold, silver, ivory, mother-of-pearl, so far surpassed anything attempted now that reference to the antique would be absolutely necessary in the production of a modern decoration of real merit. The immensity of the firearms industry of old is beyond the imagination of the uninitiated; it clearly indicates the necessity of studying the close relation between skill with arms and human progress. The money value of so great an industry had a strong influence upon the economics of the times, and needs attention in regard to the present and the future. Debatable aspects of history are clarified by the presentation of infor-

mation hitherto neglected regarding weapons used in critical periods of decisive warfare; and history is enriched by the addition of facts connected with those antique implements which assisted in the spread of civilization, the growth of a new nation, and affected the totality of human progress.

It is a matter of only three centuries since the present populous and highly civilized United States of America was one vast wilderness, not affected in any way by the few scattering settlements of white people from Europe who maintained a precarious existence in the midst of the native population of savages. Later, when the villages became thriving towns and the neighboring savages were greatly weakened in numbers and strength, England became ruler of the land. Then France, having possessions on the north and claiming the wilderness to the west, strove with England for what she possessed. In these French wars the Colonists became acquainted with each other, and of united sympathy and purpose. When England's rule was no longer acceptable they formed a league against her, and the struggle for freedom which began in 1775 terminated the Colonial period.

The Colonial period, which was one of almost constant warfare yet also one of tremendous growth, divides into the period of skirmish and warfare with

the Indians between 1607 and 1689, and the period of the French wars lasting from 1689 to 1763.

The first settlers in the new country brought firearms — presumably such as had seen long service — which may have been made in any part of Europe except Russia. During the next generation arms began to be made in America, by European immigrant armorers, after European models. Thereafter firearms were made in increasing numbers in the American Colonies, and imported also in quantities, particularly from England and the Netherlands. When the wars with France were in progress English and French soldiers brought to America the military arms of their nations, and their officers brought the high-grade arms of celebrated European armorers. Firearms of America and of Europe are therefore intimately related in Colonial history.

Beginning the period 1607 to 1689, the skirmishing between the earliest settlers and the Indians was on a small scale, partaking less of the nature of warfare than of the maintenance of individual rights. In addition to the personal property arms which guarded each man's fireside, each considerable settlement, as Jamestown, New Netherlands (New York and Albany), and Plymouth, possessed a stock of old arms held as common property. The early settlers — with the exception of a very few persons

of power or wealth at Jamestown and in New Netherlands, and Captain Miles Standish at Plymouth, who owned superior weapons — were people of ordinary or poor circumstances, who used the cheapest firearm of the time, the matchlock gun, then made throughout civilized Europe. Matchlock arms were the cheapest because they were easiest to make, they were obsolete, and second-hand ones at reduced prices were abundant. They were still the principal military firearms, but as sporting weapons they had been superseded for fifty or seventy-five years.

The name matchlock is compound, match being an abbreviation of slow-match, which was a slender rope treated in various ways so as to burn slowly without flame but with a persistent live coal, and the word lock, which in firearm phrase means firing mechanism. A match-lock was a mechanism on the side — generally the right side — of a gun barrel by which a hot coal on the end of a slow-match was held in the grip of a piece of curved metal called a serpentine, serpentine and coal together being moved to ignite the priming in the flash-pan by pressure on the trigger, and raised out of the flash-pan by the trigger-spring when the pressure was removed. In the early days of this mechanism the motion of the serpentine was towards the breech instead of towards the muzzle, the idea being to present the coal con-

stantly to the view of the gunner, that he might keep it free of ash. When firing the gun soldiers were instructed to tip it so that the lock should be uppermost, with the barrel to one side, so that gravity should aid the connection between the priming powder in the pan and the powder in the barrel. This tipping of the barrel sideways hindered taking accurate aim, but that was a matter of no importance since the guns were not accurate, were fired only at short range, and were not commonly provided with sights.

Fowling-pieces and other guns not considered to be strictly military weapons were supported by the hands and held with the butt against the thigh, waist, or shoulder, or gripped between the upper arm and the body, but full muskets were supported near the muzzle by the forked tip of a long iron rod, the other and sharp end of which was thrust into the ground. Although the musket was so heavy that the rest was useful, it was not absolutely necessary; its use was due to its requirement by the manual of arms, and the manual of arms was a survival of the time when guns were without locks and both of a soldier's hands had to be employed in the manipulation of the gun, match, pan, and priming. This general description applies, with the exceptions noted, to the arms in use in the early years of settlement.

With the advent of the thousand Puritans who settled and named Boston in 1630, and who formed a colony of considerable means, other firearms appear, representing as private property all the types of firearms then known (matchlock, wheellock, snaphance, and flintlock, named in the order of their invention), and as public property such as were then in common military use in Europe. As prelude to the first Indian war (the Pequot War, 1637) the Colonists were for the first time able to equip a company with weapons superior to those of the Indians. The following list, taken from the records of the Puritans, shows some of the common property arms which were purchased in 1628 or 1629 in anticipation of their migration to the new country.

> 80 bastard muskets with snaphances and four foot barrels, without rests.
> 6 fowling pieces 6½ foot long, musket bore.
> 4 fowling pieces 5½ foot long, bastard musket bore.
> 10 full muskets, 4 foot barrels, matchlocks, and rests.

These ninety snaphance arms are the first public property ones in quantity of which Colonial record has been found. They may have been snaphance as the term is now understood, and they may have been true flintlock, for the names snaphance and flintlock were then used indiscriminately.

With matchlock guns only it is doubtful if the Colonists could have brought to a speedy termination the trouble with the Pequots. These Indians, an unusually fierce tribe, were attacked in their fort in 1637 by soldiers of the Massachusetts Bay Company, and about one half their whole tribe killed then and there. The success of the whites in that massacre was due to chance — the fact that they got inside the fort undiscovered in the night. They set fire to the wigwams, guarded the exits to the stockade, cut down the Indians who tried to pass, and shot those who were driven from cover by the fire and exposed by its light. There still remained at large in various parts of the Connecticut Valley some hundreds of revengeful, desperate, and crafty warriors armed with bows, matchlock guns, and a few snaphance pistols. To exterminate or to drive away those enemies was a task that required better guns than matchlocks; yet the task was quickly performed.

The matchlock gun was in many respects inferior to the Indian's bow; its merit consisted chiefly in the panic produced by the flash, smoke, smell, and noise, and to the fact that while the bow could throw but one missile at a time, the gun, commonly loaded with several bullets, could wound several adversaries at once. A bullet from a matchlock gun was

superior to an arrow only in the size of the hole it tore, the bones it smashed, and the amount of blood it let out; a small bullet was less effective than an arrow. The gun was not superior to the bow in range or accuracy; it was vastly inferior in rapidity of fire; the gun was heavy to carry and clumsy to use; the bow was light, easy to manage, and made no noise to betray its owner's location; the bow was constantly ready for use except in a long rain, while the slow-match required in the best of weather constant attention to keep it alight, and in dampness, rain, and wind was worse than uncertain. The light from the slow-match also prevented ambush at night, and the smell prevented a surprise at any other time than when the breeze blew opposite to the direction of attack. While one battle of a war may be won by chance, a war is not; hence the evidence of superior arms in the quick termination of the Pequot War.

As the Indian's natural weapon was better than the matchlock gun, it is to be supposed that the Indian would hold the gun in contempt, but the contrary is true. Its pyrotechnic qualities savored to him of magic, and made him covetous of it. The Virginia and the Massachusetts records both state that by 1628 the Indians were well supplied with firearms, including pistols and bullet molds. Of

course the statements refer only to the few Indians in the immediate vicinity of the settlements.

After the Pequot War there was an interval up to 1676 in which Indian troubles were of minor importance, not being on a large scale, and this immunity from danger, together with the abundance everywhere of game almost at the dooryards, made the Colonists from north to south a community of hunters. They were not unmindful of the necessity of military training, however, and purchased and stored town property arms against time of need. Records of 1647 show town property arms of three kinds, and other records give prices of both military and sporting arms in use before King Philip's War (1676). Quantities of arms came to America by purchase or as the property of refugees from troubles in England, which had helped to fight the battles between King Charles and Oliver Cromwell. In that long and bloody struggle every kind of firearm however old or new was pressed into service of either party wherever found, and America got the overflow.

IN 1647

Name	Length of bbl.	Bullets to the lb.	Type of arm
Musket......	4 feet	10	Matchlock
Harquebuss ..	2½ feet	17	Wheellock
Carbine	2½ feet	24	Flintlock

The name harquebus—French arquebuse—was older than that of musket, and applied to a matchlock or wheellock gun having a stock made to go against the shoulder and bring the breech to the eye. The stock had a good deal of drop, and was clumsy, with several curves on the upper side. Before the date of the Puritans the caliber accommodated 20 to 22 round balls to the pound. At the time the Puritans came the musket had a straighter stock than the harquebus, of simpler outline, and the bore took 12 to 16 round balls to the pound. By 1640 the harquebus and the musket were similar in form, the difference being mainly in size and caliber. In Puritan times any gun-bearing soldier, not mounted, was unofficially called a "musketeer." A carbine was any small sized gun, intended especially for a horseman. His firearm accessories were similar to those of a musketeer.

The law required a musketeer to have as adjuncts

to his musket a priming wire, worm, scourer, bullet mold, rest, bandolier, 1 lb. powder, 12 ft. of slow-match, and 20 bullets. The requirements for match, wheel, and flint arms must have been similar. Bayonets were not then in use. Ramrods were of wood. A bandolier was a shoulder strap hung with many little boxes, usually cylindrical, each of which held a charge of powder and a ball; they jangled like sleigh bells. Beginning with King Philip's War cartridge boxes quickly superseded them.

The bore of non-military arms was of all sizes to suit all tastes, that of fowling-pieces being commonly as small as quarter of an inch, to fire a single ball. The bore of military arms was on the decrease in the mother country, and the Colonists occasionally fell in with the procession. By act of 1645, muskets made in the Colonies were to have barrels not less than 3 ft. 9 in., nor more than 4 ft. 3 in., nor under bastard musket bore.

The prices of firearms and accessories in the Colonies between 1652 and 1680 are shown by the account book of John Pynchon, merchant, of Hadley, Mass.: worm 6 *d.*; match 2 *d.* per fathom, some 4 and 6; horn powder flask 5 *s.*; powder horn 8 *d.*; gun 20 *s.*, 30 *s.* and up; fowling-piece 25 *s.*; gunlocks 6 *s.* to 8 *s.* 4 *d.*; flints 6 and 8 *d.* each; carbines 25 to 30 *s.* each; a pair of pistols and holsters 37 *s.* We can safely

estimate that a shilling then was at least equal to a dollar now; even so Pynchon's firearms must have been made only for service, not at all for looks.

Before the outbreak of King Philip's War the old matchlock muskets were out of favor, and just before the war, in September, 1673, the Massachusetts General Court desired "Hezekiah Usher to purchase in England 500 new snaphance or firelock muskets." Shortly after the war began the general use of the ancient inefficient matchlock was abandoned, and all soldiers were ordered to have "flint firearms if possible, those of the troopers (horsemen) to be carbines." November 3, 1675, every town was ordered to provide 6 gun flints to each of its soldiers. From the slight mention in the records of wheellock arms, it is evident that they were not abundant in America; they were too expensive, even the plainest costing twice as much as a good matchlock and half as much again as a flintlock; also they could endure less abuse. They were less common abroad, also, than the other types. They were no novelty, however. In the development of firing mechanisms they were the second type.

Matchlocks were invented shortly after hand firearms came into use — possibly at the city of Liège as early as 1375. Wheellocks were probably originated at the city of Nuremberg about 1515. Snap-

hances were probably in considerable use as early as 1585, and their developed form, now called flintlocks, may have been invented in several places, independently, between 1580 and 1600. The tendency of information gained from recent research is to set the dates of snaphance and flintlock earlier than those given by nineteenth-century investigators; the immediate and wide adoption of these new types was, however, impossible for many reasons.

When flint arms became common in America stringent laws were enacted prohibiting the sale of firearms to the Indians. But they obtained a few in spite of the watchfulness of the authorities, for the cupidity of traders was unable to resist the temptation of lavish offerings; to an Indian, refusal to trade meant merely that he must raise his bid; when he had offered his all he left only to return with more; he offered a hundred times — five hundred times — as much as a white man would give; he was determined to have a magic stick at any price; and in time he got it. But a gun in an Indian's hands was a less formidable weapon than in a white man's, for the Indian's haphazard nature precluded good marksmanship; shiftlessness caused the gun to be speedily injured by neglect, and after that it was soon ruined by rough usage; when the gun was spoiled the bow was resumed, and, so armed, the

savage of the period of the Colonial wars was no match for the white man.

The first period, 1607 to 1789, sums up thus: the thirteen years up to 1630 were years of peace and poverty. Colonial soldiers wore body armor which was usually proof against arrows, and when attacked by small numbers of Indians could hold their own. Colonial arms of offence were then so inefficient that persistent and concerted Indian aggression could have cleared the country of every Colonist. When the Pequots in 1637 undertook formidable resistance the Indian's chance for success had passed. The white soldier still wore body armor good against arrows; the white man's inefficient matchlock was in part replaced by the far better flint gun; the Indian had no armor to stop a bullet, and comparatively few serviceable firearms. When King Philip organized an Indian league against the whites the Indians were no better equipped than before; the Colonists, however, had, with the advent of prosperity, provided an abundance of flint arms, and were able to maintain vigorous aggressive warfare. The Indian fought for his rights and his country with primitive weapons; the white man fought with flintlock guns, and the white man won.

With the outbreak of the French wars a different condition of affairs arose. White English subject

was now pitted against white French subject; experience and ability or ignorance and inefficiency were not all on one side; the wars themselves were parts of wars abroad, and the firearms used in the Colonies were, in the indecisive first period, largely supplied by the mother countries; but in the more important second period the French still used arms furnished by France while the Colonists had forged to the front in firearm development and were makers and users of the most effective weapon for their kind of fighting then in the world.

Considering the firearms in the order of those of British, those of French, and those of American manufacture, London made arms first claim attention as the earliest made in Great Britain. The fabrication of firearms there is believed to have been begun by Henry the Eighth (1509 to 1547). In the early part of his reign his military arms were all purchased abroad, chiefly from Flanders, but in 1543 he induced the Flemings, Peter Bawd, and Peter Van Collen, to settle in London as gun and ordnance makers. In Elizabeth's reign (1558 to 1603) the business increased until there were 37 accredited gun makers in that part of London called the Minories. During Elizabeth's last years and the first few of her successor James the First (1603 to 1625) trade dwindled until, in 1607, London had

only five gun makers. Under his successor Charles the First (1625 to 1649), who was considerable of a sportsman and maintained a large and sporty court, the business so increased that in 1637 the London gun makers became a chartered corporation. They maintained that arms made in England, honestly made and proved, should have first choice when the government or Englishmen needed to purchase; and to identify the arms made by The Company of Workmen Armorers of London they adopted as their proof mark the letter A (for Armorers) and a crown. This incorporation and the adoption of a proof mark was the beginning of the compulsory proof of firearms in England, and the beginning also of a firearms industry in London which increased to enormous economic importance in the late Colonial period, and culminated about the period 1785 to 1830 in the superlative fame of London made arms for beauty of design and perfection of quality and finish. But in 1637 London made arms were not considered the equals of the best foreign made ones, nor for many generations thereafter, nor were English firearms sufficient in quantity to equip English soldiery. The principal reason for this appears to be lack of government patronage. Firearms come under the head of Articles of Limited Sale when manufactured only for the general public.

In London's early firearms industry English sovereigns were not in the habit of dictating to their soldiery the specific variety of gun or pistol to use nor where to purchase it. Captains of companies were responsible to their superior officers only for the serviceability of the weapons of their men; the size, shape, caliber, nationality, and cost of the weapons were immaterial, and they could purchase where they chose. Charles the First introduced some innovations. He had all the arms in his kingdom examined and repaired by seven gunsmiths whom he appointed, about 1640, to go about the country with their deputies and assistants to "survey, make, alter, mend, dress, repair, prove, and stamp — if need be all — guns fit for service." All firearms were to be taken to the muster places once a year or oftener, to be viewed, altered, mended, etc. The stamps were to be A and a crown (the seven surveyors were members of the London Armorers), and two other stamps to distinguish the county where the arms were and the individual who did the stamping. Many of these arms afterwards got to America and did deserving duty on game and redskins. Charles also set a scale of prices for altering and repairing old arms, and retail prices for new ones. From the latter these are taken:

	£.	s.	d.
New Musket, Mold, Worm, and Scourer.......		15	0
New Musket Rest			10
New Bandolier with 12 Chargers, Prymer, Pryming wire, Bullet bag, Strap 2″ Wide		2	6
New Pair Firelock Pistols with Key, Mold, Scourer, Worm, Flask, and Cases of Leather	3	0	0*
New Pair Horseman's Pistols furnished with Snaphances and Furniture as above	2	0	0
New Harque-buze with Firelock and Belt, Swivel, Flask, Key, Molds, Worm, and Scourer	1	6	0*
New Carbine, with a Snaphance, Belt, Swivel, Flask, etc., as aforesaid	1	0	0

In England the change in the firearms industry from a precarious one to a fixed one, and from a soldiery owning miscellaneous weapons to a soldiery equipped with government weapons, came with government patronage of the home industry, and with the expiration of the Stuart line of sovereigns and the advent of the German line. When, in 1689, King William's War began, England was still using the matchlock musket in her armies. General Monk had, in 1660, armed his regiment with flintlocks, and in 1683 the guards were armed with flintlocks; but other regiments were using mixed arms having a fixed proportion of match and flint locks, probably half and half. The Grenadiers,

* Here firelock is used for wheellock. £3 was about equal to $60 of present money: £1 6 s. to $26, etc.

established in 1678, were carrying hand grenades and matchlock muskets; minor companies had flint carbines and hammer-hatchets; twelve men in each troop of dragoons had halberds and pistols, the rest had flint muskets and cartridge boxes. King William, familiar with warfare on the continent against the progressive Louis XIV of France, and with the superiority of flint to earlier arms, caused the adoption of the flint musket in 1690 as the regulation British military arm. Before his time such flint military weapons as England used, had with few exceptions been purchased abroad — principally from Germany and that part of the Netherlands now called Belgium. King William favored the domestic manufacture of England's firearms, and in the first year of his reign (1689) let to the gun-makers of Birmingham their first government contract. Firearms had been manufactured in Birmingham for a quarter of a century before, and a quantity was made there in 1683, but this contract marks the real beginning of the great industry which made and makes Birmingham one of the great arms-making cities of the world. A part of King William's fourth contract with the Birmingham smiths, made in 1692, is still in existence, and is as follows: "William Bourne, Tho. Moore, John West, Rich'd Weston, & Jacob Austin

to deliver 200 snaphance muskets per month for one year from March 26 1692; guns to be 3 ft. 10 in. long with walnut or ash stocks. One half shall have flat locks engraved; one half round locks; all to have brass pipes and heel plates; all to be varnished; six threads to the breech screws; to be proved at Birmingham according to the Tower proof; to be marked with the office marks; price 17 shillings each in Birmingham, cartage to London extra." The lock plates were 7¼ in. long. There was no bridle. These muskets were marked on the lock plate "W R," for William Rex, and part of them bore also the name of the maker. The "proof" mentioned meant that each gun was to be fired with a charge of powder and lead several times as great as formed a regular charge. If, after the test, the gun was undamaged, a proof mark was put on the barrel to signify that the gun was strong and safe.

From King William's time to the first of the nineteenth century London and Birmingham were rivals in the arms industry. Both furnished arms to the Crown and the Colonies; but Birmingham, on account of cheaper manufacturing facilities, furnished the more. The military arms of the one were as good as those of the other, and neither was superior in any way to the ordinary flint musket of other countries. These two cities produced the

major part of British flint military arms, but gun makers were scattered throughout England in the eighteenth century, were somewhat abundant in Ireland in and about Dublin, and in Scotland were locally celebrated in Doune, Perth, Stirling, Dundee, and Glasgow. Some of these gun makers engaged as sub-contractors to London and Birmingham holders of government contracts. Their arms, proved at London and Birmingham with those produced by the contractor, cannot now be recognized. Arms made for the government in Ireland were proved at the government office in Dublin Castle, and so stamped. Arms made for individuals, the militia, or for the Colonial trade, in Scotland or Ireland, were exempt from the proof laws, and their lack of proof marks is the only help in identifying them at present.

In the period 1689 to 1763 England produced, used, and exported to America an enormous number of muskets of various sizes and shapes, and a large number of fowling-pieces and pistols. They were almost entirely single-shot arms. These muskets, fowling-pieces, and pistols were to a considerable extent used by the Colonists in the French and Indian Wars, and later were turned wholesale against the British during the Revolution.

In France the manufacture of firearms as a large

industry seems to have begun at St. Etienne, a manufacturing city on a branch of the river Loire, 36 miles southwest of Lyons. The manufacture in quantities of arms for war began there in 1535 during the reign of Francis I, but sporting arms had been made before. The first armory established by the French government was at St. Etienne in 1669, and the armory there is now the principal one in France. At Tulle, not far from the center of France, a firearms industry was well established by 1646, and in 1690 a government armory was located there which is still operating. Maubeuge and Charleville were the two other prominent armories. In 1630 France adopted the flintlock for her armies, and these two armories furnished the arms for the French troops in America. In 1694 French muskets were commonly about 5 ft. long, with barrels about 3 ft. 8 in. long, and took 30 balls to the pound. Until 1718 each captain was responsible for the armament of his company, and, the weapons being serviceable, he was otherwise free to choose or to allow his soldiers to choose without regard to close similarity of size, shape, weight, caliber, etc. This weakness in armament was not peculiar to France — it was common to the civilized world.

But France in 1717 began to make in her armories

guns all alike for her infantry, following as closely as convenient in each armory a series of measurements and a system of manufacture. Thenceforth French government arms were made according to a model arm, thereby insuring throughout a company or even a regiment uniformity as to ammunition, weight, handiness, range, and rapidity of fire. These model 1717 fusils were longer even than the English gun of the period — the idea being to be able to deliver simultaneous fire from three ranks, and, when using the bayonet, to have in the gun some of the reaching qualities of the pike.

The model 1717 musket is as follows: Length about 5 ft. 2½ in.; bbl. about 46⅞ in.; one breech flat situated on top; muzzle-sight serves as bayonet stud; bbl. fastened to stock by 4 pins (not screws, but pins), and a single band situated one third the distance from the muzzle to the touch-hole; cal. about .69, taking 18 round bullets to the pound. Large stock; butt has high comb; fore-end tip of iron; both sling swivels are rings and are on the left side, one being fastened to the band, the other to the wood just back of the side plate. Lock plate flat, rear edge oval; iron pan with fence, exterior of pan has 3 flat faces; the screw upon which the frizzen turns is not connected to an extension of the pan, but instead is connected by an iron strap

to the screw of the frizzen spring; goose-neck cock, flat faced with beveled edges; rounded screw heads; wooden ramrod; socket bayonet about 18 in. long over all; slot has one right-angled turn, bayonet therefore not rigid on gun. No brass. Outline of under edge of grip and butt concave.

Following this model came the model 1728, in which pins to hold the barrel and forestock together were entirely omitted, and their place taken by three bands, the forward one being long, with two straps over the barrel, and serving also as a ramrod funnel. With the exception of a few other slight changes, the gun was otherwise similar to the preceding model. It was the first government-model arm of any country to make use of bands instead of pins, and, in comparison with the English military arm, was an improvement in respect to strength when clubbed, and in speedy dismantling and assembling.

Muskets of this kind were issued until 1746, when some changes were made with the idea of improving both the serviceability and the appearance. The length of the gun — about 5 ft. 3 in., and of the barrel about 47 in.—remained the same, but the rear portion of the barrel was made octagonal, the rear portion of the face of the lock plate was convexed, the recesses in the forestock to take the bands were omitted, and the bands were friction

tight instead of fastened; the muzzle band was shortened, and the ramrod was made entirely of iron instead of wood or wood tipped with iron as formerly. The change from wooden ramrod to iron ramrod was to keep pace with England, where newly made military guns had been equipped with iron ramrods since 1730. Otherwise the model 1746 gun was no great improvement over the 1717 model, and defects in the new gun soon showed themselves.

In 1754 a fourth model was issued. The sling rings (still circular) were now placed underneath instead of on the left side as formerly, the bands were fastened by springs, the muzzle band was greatly lengthened, and a uniform weight of 10¼ lb. was set. A small edition of this musket was issued for the officers, to weigh 7 lb., total length 4½ ft., mountings engraved. Even a general wore a gun on his back, whatever his rank or country.

These were the infantry arms used in the American wars against the Colonists and the English. No other changes occurred until 1763, and then the change was considerable, but the description of that model belongs with the tale of the Revolution. All these early French muskets had gooseneck cocks, as did the Brown Bess muskets. Under the combined stress of the jaw screw and the mainspring,

gooseneck cocks often broke at the slender place just beneath the jaw, and put the gun out of service during a battle. The improved form of cock with the braced under jaw was, however, used in France as early as 1648, and perhaps also in England shortly after.

Neither the French musket nor the Brown Bess of the opposite side was a weapon of precision, but of the two the French musket was more carefully made, the bullet fitted the bore a little closer, and it was a little more accurate in its shooting; it was not so much better, however, as to hold any great advantage. These French muskets shot 18 bullets to the pound; their caliber was therefore about sixty-nine one hundredths of an inch, and varied in a large number of arms but little. The English authorities were at that time lax in their requirements for the maintenance of a standard, and accepted of the contractors arms that varied considerably in design and dimensions; also variations in the caliber between 72 and 80 were not considered abnormalities, although the English musket was supposed to shoot 12 bullets to the pound and to be .75 caliber.

Besides the musket both the French and the English used carbines; they were merely small editions of the musket, and of less caliber. French

ranger companies, part of whose duty was to get game, were provided with long, slender guns of government make. The French troops on European territory used other arms; as far back as 1727 the King's Guards had musketoons of elegant design and superior finish, and the cadets had small elegant muskets of light weight; in 1718 and 1728 rampart guns of two different models were issued; the soldiers of certain companies of grenadiers carried, up to 1760, queer little hand cannon or portable mortars for throwing grenades aloft that they might fall into the enemy's entrenchments; in the navy blunderbusses formed an important part of the armament of each ship; and as far back as 1693 there was a regiment of riflemen, and in 1720 this regiment was ordered to be provided with bullets of two sizes: one, the size of the bore, had to be driven home with a mallet and iron ramrod; the other size was sufficiently small to be dropped down the gun barrel for quick loading in an emergency. These rifles had 30-inch barrels, rifled with lands and grooves of equal width. Officers had short ones. Maréchal Saxe (1696–1750) had a company armed with his amusettes — breech-loading rifles. It is not certain that any of these fancy arms were engaged in the wars in America, but it is possible. A few repeating arms were made use of in a military way

in America, but not to an extent having more than a superficial influence. There is, for instance, record that Frontenac in 1690 astonished the Iroquois with his three and five shot repeaters. These arms could not have been practical and serviceable military weapons because the flint-and-steel spark principle of ignition precluded the safe use of a single-barrel multi-shot firearm, and multi-barrel military guns would have been monstrosities. No further mention of them occurs. Pistols in the French War period were still private property arms. There was no government-model pistol (the first was in 1763) so that a mixed lot was in use.

In the Colonies it is questionable if a single firearm was made before the immigration of gunsmiths with the Puritans. Following the first thousand Puritans of 1630, settlers arrived in such a constant stream that by 1640 there were more than twenty thousand whites in New England alone. Throughout the Colonies no implements were more abundant than firearms; none was more in use, more used up, more in demand. Gunsmiths of Europe flocked to the Colonies, sure of steady employment at repairing, and making, and selling. Between the Pequot War and King William's War it is probable that fully one third of the firearms in use by the Colonists were made in the Colonies. The

amount of real money paid for them was excessive, the general poverty in other manufactured articles being taken into consideration. Old deeds and wills show that gunsmiths quickly gained property, and old town records show that many of them, as men of substance and respected citizens, were given civil and military positions of honor. In the period between King William's War and the Revolution, records indicate that firearms manufacturing was the greatest of all Colonial industries requiring highly skilled labor. Yet the home consumption was so great that muskets, fowling-pieces, pistols, and their accessories, were imported in such quantities from Europe — particularly from England— as to form one of the principal imports of the time.

Although many of the early Colonial armorers were masters of their trade, few of them made the locks which they put on their guns. The lock of an ordinary flint gun was the most intricate part of it, and lock making was a trade in itself; as a rule an European made lock could be imported at less cost than a Colonial gunsmith could afford to make one for. The European locks when of fine quality frequently bore the names of the makers. A Colonial made gun with a foreign marked lock is now sometimes difficult to identify. When without any mark at all of the Colonial maker, the lack of a metal

butt plate, or indications that when new the gun was without a butt plate, a stock made of wood distinctively of early American use for guns, — such as cherry, red birch, red maple, curly maple, American black walnut, dogwood, — and most uncertain of all, tradition, may help in the identification. Identification by resemblance to another arm the origin of which is known is not proof unless sanctioned by a firearm antiquarian of great knowledge, experience, and judgment; resemblances among different makes of old arms are as common as between unrelated humans.

Few fine and expensive guns were made in America prior to the French wars, and few pistols prior to the Revolution. The firearm demand in the Colonies was for plain, strong, military and hunting weapons. Beginning about 1710 commerce brought wealth to some of the merchants in the northern Colonies, and with other luxuries fancy firearms began to be in demand. In the Massachusetts Historical Collection, series 4, vol. 5, is the record that in 1722 "They" (the Indian guests) "were also entertained with the sight of a curious gun made by Mr. Pim of Boston, which once loaded was discharged eleven times following with bullets in the space of two minutes, each of which went through a double door at 50 yds. distance." But Mr. Pim of Boston had done noth-

ing more extraordinary than had been done before in Europe, and the military and sporting smooth-bores of early America, however good or bad, were merely on a par with those of the mother countries.

There was, however, at this time evolving a distinctively American firearm — the long rifle — which of all firearms up to the perfecting of the revolver, also American, had the greatest influence upon history, both American and foreign. Up to this time the world had been content with missile weapons which were not accurate. Each generation had perfected its kind of weapons and believed them to be the best possible. Each generation had produced men so endowed physically and mentally as to be able to get from their weapons all the accuracy of which they were capable. But that did not mean that the weapons were weapons of precision. The bow could send an occasional arrow to the mark, circumstances abetting, but the bowman could never guarantee his shot in advance. The arbalète or crossbow was sometimes a little more accurate on account of having sights and of using a more perfect arrow or bolt. The gun or the musket when first class was a little more accurate than the arbalète because the barrel facilitated better alignment and the missile was quicker on its journey, and on account

of its smaller area less affected by atmospheric influences. But neither the arbalist nor the gunner could guarantee hitting his mark even at medium range and under favorable conditions. In the case of the gun the interval between trigger action and the issue of the bullet was detrimental to good aiming, and further yet, the weapon itself was incapable of causing a succession of equal results. The wonderful tales of the marksmanship of Robin Hood, Jack o' Flanders, Dick Turpin, and any other celebrated bowman, arbalist, or smoothbore wizard, are told for the credulous — they are only tales. Before the advent of the American rifle there never had been such a thing as even an approach to precision in a weapon of offence, and, strictly speaking, precision is yet ungained; but there is, and long has been, a close approach to it. The designers of the American flintlock rifle took the first firm step, and to American ingenuity and science about every succeeding advance has been due.

It was about 1700, or 1710, when the Colonial period was more than half passed, that there came to the eastern part of Pennsylvania and its borders an advance guard of a host of Germans and Palatine Swiss who at home were artisans and many of them gun makers. Central Europe, which included their home country, was then the only place in the world

where rifles were made and used in considerable numbers.

Rifles having either straight or spiral grooving had been constantly in use there since Gaspard Kollner of Vienna became celebrated for rifled guns as early as 1500. And rifles were in the same stage of undevelopment in 1700 as they were two centuries before. They were short, heavy, clumsy, an inch or so in bore, terrific in recoil, spiraled and deep grooved by guess and not by knowledge of cause and effect, slow to load, more powerful but only a little more accurate than a good smoothbore. The bare lead ball was driven down the barrel by blows of a mallet or a hammer upon an iron ramrod, and after the first shot had fouled the barrel the loading of a rifle frequently occupied fifteen minutes or more. The immigrant gunsmiths began in America an immediate output of their wares for use upon the abundant game of their new country.

But the shooting conditions in Europe and in America were very different. Europe was thickly settled. There the unsuccessful hunter could readily supply by purchase the dinner which he lost by a bad shot. There ammunition could be procured almost anywhere. And, in Europe, if the rifle was used in warfare, the slowness of the loading was not a very material defect, since it was common to both

sides. But in America the pioneer traveled the immense wilderness, dependent upon his weapon for food and life. The weapon must be accurate, and must waste none of the powder of the charge, hence a long barrel was necessary. Ammunition sufficient for a long period must be carried on the person; hence a small-bore weapon, that many charges might weigh little. It was important that the sound of the shot should be the least possible, that it might not reach the ears of distant savages; therefore the barrel needed to contain the greatest possible amount of metal, to absorb sound vibrations, and yet be manageable. Speedy repetition of fire was absolutely necessary if the rifle was to be a competitor of the murderous Indian's bow; hence there must be an improvement in seating the ball.

All these changes did not occur at once. Pioneers and gunsmiths consulted and experimented and changed and improved a little at a time here and there until, perhaps as early as 1750, a new form of weapon had come into general use. This was the long, slender, graceful, heavy, small-bore rifle, using a ball of an ounce in weight, and in Kentucky times of half-ounce weight, which could be fired in rapid sequence because the ball was lubricated. Who invented a greased "patch" is now unknown, but

it was a stroke of genius, and was the perfect adaptation of means to an end. No heavy iron ramrod, deforming both the ball and the grooves, and no cumbersome mallet was now needed. No great amount of time was used in loading the pioneer's rifle. In the stock of the gun there was a little box with a hinged cover. In it were kept a lot of circular pieces of greased linen or leather, all the same size and cut with a die. The powder being poured into the barrel and the rifle held perpendicular with the butt on the ground, one of the greased patches was laid on the muzzle, concentrically, the ball placed on it, and pressed into the bore with the thumb. Then the light wooden ramrod was drawn from the thimbles, the head put to the ball, and with one long sweep of the arm the lubricated ball slid down the barrel until it stopped upon the powder. A few whangs with the ramrod expanded the ball by flattening it so that it held its position. The powder was fine of grain and quick of ignition; therefore when the rifle was fired the impact of the explosion acting against the inertia of the lead caused the ball to expand circumferentially and, with its cover, fill the grooves, preventing the escape of gas and receiving rotation. Upon exit from the muzzle the unfastened patch became detached from the ball, which flew toward the mark. And so patiently

and ingeniously had the pioneers and the gunsmiths experimented, some little idea of the relation of the velocity of rotation of a bullet to its caliber, mass, and velocity of flight had dawned upon the new American rifle makers, and, allowing that the distance was under one hundred yards and the area of the mark ten square inches or more, a ball directed by an experienced marksman was almost sure to find the mark.

Now for the first time was there a weapon which was capable of repeating consecutively for a large number of times its first performance. Now for the first time could an intelligent man be sure of the limits bounding his own capabilities and those of his weapon, and by brains and experience get to know the limits within which he and his weapon could do the same thing time after time, unvaryingly, like a machine. And now for the first time in the history of the world was there a community of men with absolute power of life and death over all others; an aggregation of men without organization or leadership, without realization of their terrific and unconquerable power, living their simple lives and doing their daily duties without ambition for conquest and supremacy. But, unintentionally, unrealizingly, they were the power that made possible a new nation.

The first really great influence of weapons of precision upon the destinies of Colonial America did not come until the Revolutionary War, but during the latter part — the important part — of the French wars American rifles and marksmen did a quiet but wonderfully valuable service deserving of an amount of recognition which they have never received. No great credit belongs to American weapons for English successes in King William's and Queen Anne's wars, but these wars in America were tentative rather than decisive; the real struggle for mastery of America began with the third war and culminated with the tremendous exertions of the fourth and last. In the third war, King George's, Pennsylvania rifles did heroic work against the Indian allies of the French in the middle Colonies, preventing acquisition of territory by French forces and saving English settlements from pillage and slaughter. Ultimately the expulsion of the French from Pennsylvania threw open to English settlement the region beyond the Alleghanys. In this war the great event of strategic importance was the capture by the English of the French stronghold of Louisburg. Louisburg, on Cape Breton Island, guarded the entrance to the St. Lawrence, and was a key to the French possessions in the new world. Its walls, twenty feet thick and skilfully arranged, were believed to be proof

against siege operations by any troops — invulnerable of course to the attacks of militia. But Pennsylvania riflemen, in trenches, advanced by night nearer and nearer to the walls of the fortress, by the precision of their weapons rendered useless such French cannon as were in their view, weakened the French army by slaughter, terrified men, officers, and commander by the certainty of their shooting, and certainly contributed more than 50 per cent to the reduction and fall of the fortress, which took place after a siege of only six weeks.

In the fourth war American rifles, by their increased numbers, did yet greater service. The French, desperate by this time, had constructed a line of fortifications from the St. Lawrence to the mouth of the Mississippi, and, being numerically not one tenth so strong as the English, had endeavored to more than make up the difference by enlisting the hordes of savages that ranged the western borders of the Colonies from the very north to the very south. In this border fighting the Indians were supplied by the French with guns and muskets. Indians and frontiersmen fought from shelter behind trees, stumps, and rocks, each man for himself, exposing the least possible amount of his person, maneuvering to keep himself hidden while getting a view of the enemy. Rarely could either Colonist or

Indian see more than a bit of an arm, breast, or head to shoot at, and in such warfare sharpshooting counted above everything else. Particularly in this war of all the Colonial wars were weapons contributary to French defeat.

In the case of the English defeat in Braddock's expedition, weapons, rifles, had a paramount influence upon subsequent history, for to them America is indebted for the life of George Washington. When Braddock's thirteen hundred soldiers stood huddled in groups in the forest near Fort Duquesne, and swarms of ambushed savages were shooting them like sheep, the trained soldiers of European battlefields were as helpless as though unarmed. No soldier of the regular army was taught to aim his musket; all that was required of him was to hold his musket horizontally from the shoulder, point it towards the ranks of the enemy, and fire at command. Braddock's soldiers saw no enemy in ranks; an officer, writing of the battle, stated that in the five or six hours while his men were being slaughtered he saw not even one Indian; and the British soldiers, whether firing in volleys or singly, shot only the trees that happened to be before their guns. No soldier's musket would have been useful at the work before it.

Of the thirteen hundred English troops, about four hundred escaped, and it is a certainty that but

for the backwoodsmen with rifles under Washington, neither he nor any other man in Braddock's army could have escaped. Washington's riflemen, behind trees in Indian fashion, firing at every hand or shoulder or tuft of hair which an Indian happened to expose, interposed so deadly a wall between the Indians and the fleeing English troops that the Indians were unable to complete their deadly work, and Washington and his men lived for future service.

Later, at the siege of Quebec, Wolf, the English commander, despaired of being able to get into battle with his foes. Not only was there no apparent way to scale the steep banks of the river which prevented his approach to the town, but his incurable illness made him certain that in case a battle became possible, victory under his direction for his army must be immediate or not at all. When, by luck, he found a way for his troops up to the plains of Abraham, he placed in front of his army those companies of Pennsylvania Provincials which he half doubted and half trusted: doubted for their inability to stand against the advance of the French regulars; trusted for the effect upon the advancing enemy of the accurate fire of their rifles — a fire which could, if the Colonials stood, mow an enemy like a scythe. His trust was well placed. Down went ranks of French veterans in windrows like mowed grain;

against their faltering rear guard went the bayonet charge of the English regulars who had backed the Colonial riflemen. "They run! they run!" exclaimed an officer. "Who run?" asked Wolf. "The French, sir," was the reply. American rifles had slaughtered them so that the survivors had to run. And therewith ended the power of France in America.

But there was yet work for American firearms in defending American homes. The English King instead of the French King now claimed to be father to the Indians, and they were not content at the change in fathers. Under Pontiac, chief of a Michigan tribe, there was a formidable and wide-spread revolt of the savages. It was so sudden that out of twelve English military posts eight were at once surprised and taken. Thus the war because of that beginning became bushranging instead of regular from the military point of view. Perhaps it was better so, for its nature excluded extensive operations by regular troops and brought into service the Colonial riflemen, who at Indian warfare could out-Indian the Indians. In spite of the immense and wild territory and the vast number of savages engaged, only two years of American shooting depleted Indian families, communities, and entire tribes to the extent of their begging for peace. It was not

New England and New York gun and musket users who did the brunt of the fighting against Pontiac's hosts; it was mid-Colonial riflemen.

From the end of Pontiac's War to the Revolution there was an interval of peace in America, in England, and in France. In consideration of the immense superiority which American firearms of precision had shown to the muskets which then formed the armament of nations, it would be expected that the interval would be occupied by the nations in complete or at least partial re-armament. In foreign countries only slight notice was, however, taken, of this new power in changing destinies. Critics commonly attribute behind-the-times armament to apathy or old-fogyism. There were and are juster causes. Expense is one. To discard all the serviceable arms of a nation, educate workmen in the technicalities of new ones, build tools and arms enough to re-arm the nation, and educate soldiers to use them, is an expense in both time and money that appalls a ruler and adds a new burden to dissatisfied taxpayers. Besides expense is doubt. Those arms which are familiar, which have served in the past, are weapons upon which a board of ordnance feels reliance, upon which they can base calculations for the future upon the certainties of the past. Novel arms, however, are unknown quantities, and when property, terri-

tory, human lives, and government are all dependent upon a nation's armament, those in power feel justified in employing all caution. This excuse for shortcomings in the past is, however, no argument for delinquencies in the present and the future.

Great Britain, for one, let the lesson go unheeded. America, naturally, kept on making rifles in proportion to her rapidly increasing population, and their influence upon economics, politics, government, and history, instead of diminishing after the Colonial period, increased with the country's progress and future wars.

DESCRIPTIONS AND ILLUSTRATIONS

OF

FIREARMS OF THE COLONIAL PERIOD

SEE ALSO THE FIREARMS OF THE REVOLUTIONARY PERIOD, SINCE IT IS IMPOSSIBLE TO SEPARATE ALL OF THE FLINT FIREARMS INTO TWO ENTIRELY DISTINCT CLASSES

MATCHLOCK MUSKET

Plate No. 2

Length 4 ft. 11 in., length of barrel 3 ft. 7 in., caliber about $\frac{11}{16}$ of an inch, taking 12 balls to the pound loosely. Length of lock plate 8 in. Weight about 10 lbs. The armorer's marks have not been identified. The wood seems to be beech, about 2 in. thick. The mountings are iron. There is no butt plate. The barrel is half octagon, and has simple front and rear sights. The pan cover is shown thrown back. This is a perfectly plain gun, intended for purely military purposes, probably made about 1580 to 1600, and is such in general style as probably formed the greater part of the public property arms of the settlers at Jamestown and Plymouth at their arrival. The gun may be somewhat older than the dates given; without identifying the marks it is impossible to set a definite date.

MATCHLOCK MUSKET (Dated 1620)

Plate No. 2

Length 5 ft. $1\frac{7}{8}$ in., length of barrel 3 ft. $10\frac{1}{2}$ in., caliber $\frac{13}{16}$ of an inch, taking 10 round balls to the pound, loosely, to allow for variations in the casting. Weight about 14 lbs. Length of lock plate $7\frac{5}{8}$ in. The lock plate is dated 1620, and the barrel and stock bear the private marks of the armorer and the stocker. The wood seems to be ash, shellacked or varnished. The ramrod is of wood, having a brass tip on the outer or ball end. This tip is indented on opposite sides to hold a rag, and in the center of the end there is a threaded hole to take a wormer and scourer. The musket is brass mounted, and in size and shape these mountings are much like those of an early Brown Bess. The thimbles are of size for a ramrod $\frac{3}{8}$ of an inch in diameter. The lock movement works from strong pressure on the trigger. The pan is like a hemispherical bowl cut in a block, and has a notch like a lip under the touch-hole. The pan cover is very large, and swings horizontally by hand towards the butt. Since the

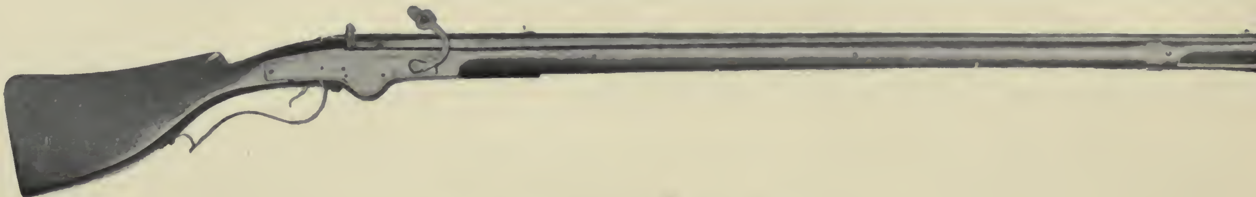
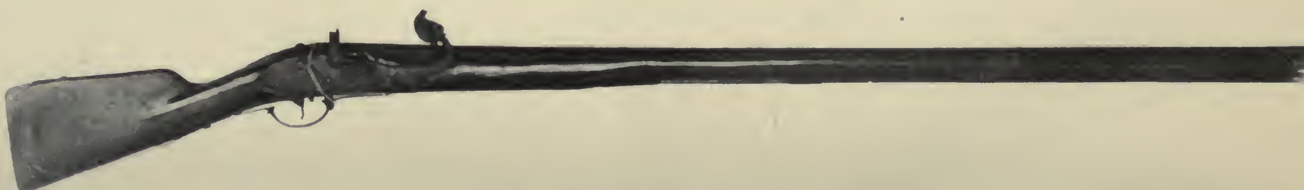


Plate No. 2. — Matchlock Musket



Matchlock Musket (Dated 1620)

pan holds a considerable amount of flash powder — it is $\frac{3}{4}$ of an inch in diameter — the fence is of enormous size to protect the shooter's eyes. This musket was presented in 1807 by William Parsons to the Massachusetts Historical Society, and bears every evidence of being all that it seems — a Colonial musket of the time of the Pilgrims. It is probable, however, that it did not come to America with them, although it may have; the greater part of the matchlock muskets of the Pilgrims were probably the old style ones, while this one in shape was then comparatively modern. It is particularly interesting as showing the derivation of the form of the flint Brown Bess from that of the matchlock Brown Bess.

GUN OR MUSKET, COMBINATION WHEEL-LOCK AND MATCHLOCK

Plate No. 3

Length 3 ft. 11½ in., barrel 31¾ in., octagonal; caliber ¾ of an inch, smooth bore. The armorer's marks have not been identified. The wood seems to be maple, turned a yellowish brown by age. It is covered with inlaying of ivory placques, engraved, and thin ivory strips forming scrolls. The character of the ornaments indicates German make. As with the wheellock holster pistol, the tang pin enters from below. The mechanisms of both locks are on the same lock plate, and both are operated by the single trigger. Pressure upon the trigger operates the wheel first, if it is wound, and if not it operates the serpentine. This combination of the wheel and matchlock, so that if one misses fire or gets out of order the other may prove serviceable, is credited to the celebrated French General Vauban, about 1670, and was used extensively by the armies of Europe; it must therefore, have been used to some extent in America. The arm shown seems to have been designed for either sporting or military purposes, and doubtless belonged to a person of consequence. It was more appropriate to sporting purposes in America than to military. The wheel is on the exterior of the lock plate.

WHEELLOCK RIFLE

Plate No. 3

Length 3 ft. 7 in., barrel $30\frac{3}{4}$ in. octagonal, caliber about $\frac{3}{4}$ of an inch; rifled with seven deep rounded grooves making one turn in about twenty-seven inches; weight about 8 lbs. The wood seems to be a variety of hard, close-grained mahogany, rather light in color, and different from any at present on the market. It is inlaid with horn, ivory, and mother of pearl, forming designs in good taste and, from an artist's standpoint, well spotted, well balanced, and harmonious in tone values. The butt plate, of horn, has at the heel a spur of iron so that the gun will not slip when standing on the floor. The lock plate is $7\frac{5}{8}$ in. long and $\frac{1}{4}$ of an inch thick at the part where the wheel is. On the exterior it is engraved with conventional designs of leaves. The cock is formed and engraved to represent a strange monster, half animal, half fish, with a bird on its head. The bird's tail, prolonged, forms the handle of the cock. There is a cover for the pan, which slides with a snap on and off, both by hand and automatically.

The interior mechanism is hidden by a cover-plate. When removed, the wheel is seen to be about an inch and a quarter in diameter, about three sixteenths of an inch thick, and contained in a recess sunk in the thickness of the lock plate. The circumference of the wheel is channeled so as to make four sharp ridges and these are cut across at intervals so as to form them into teeth. When the cock is in position ready for firing it presses its pyrites (or flint) very hard against this toothed circumference of the wheel, and when the wheel revolves, which it does with tremendous force and speed, it reduces a considerable portion of the flint to chips and dust and at the same time causes, under favorable conditions, a great quantity of sparks in the pan. If grease or wet exists there the grinding of the flint produces no sparks. One end of the axle on which the wheel turns passes outward through the lock plate, and, square in section, receives the spanner which winds the lock. The other end of the axle is held in the cover-plate before mentioned. Between this bearing and the wheel there is an offset to which is swiveled one end of a chain. The other end of the chain is swiveled to the end of a spring of tremendous power. On the face of the wheel, which is flush with the inner face of the lock plate, there are two depressions, serving as notches, and

Plate No. 3. — Gun or Musket, Combination Wheellock and Matchlock

Wheellock Rifle

as the wheel is wound a lever bearing a knob stands ready to slip into a notch and hold the lock at cock. The force exerted by the wheel together with the shape of the notch act together in a tendency to throw the knob out of the notch, but this is prevented by the sear at the other end of the lever. The mechanism operates by the trigger action on this sear. As the wheel starts to run a projecting arm throws the pan cover forward out of the way. The mechanism of this lock is a beautiful example of skilful hand forging, so accurately done as not to need smoothing or shaping by the file. The edges of the main spring are ornamented with simple chiseling. This lock is not badly worn and is in perfect working order. The whole gun is as serviceable to-day as when new. This weapon was made either for a sporting piece or the military arm of an officer of high rank; the dividing line between such arms was usually almost invisible. In Colonial history it is appropriate to the period preceding 1700.

THE INTERIOR OF THE LOCK OF THE WHEELLOCK RIFLE

PLATE No. 4

a is the pan cover, shown in the forward or off position. *a′* is its spring.

b is the wheel; a small portion of its circumference extends into the pan.

c is the cock, which when drawn over presses its pyrites or flint against the wheel. On account of the great power of the spring which bears on the cock the ornamental tail to the cock is really a necessary lever to move it.

d is the back arm of the mainspring; its other arm is hidden by the cover-plate *e*, as also the crank of the wheel, the chain connecting it to the small arm of the mainspring, and the gear which automatically throws the pan-cover.

f is the curved lever, which bears its knob on the wheel, ready to slip it into a depression as the wheel is wound by the spanner.

g is the arm of the sear against which the trigger acts to trip the sear and cause the wheel to revolve.

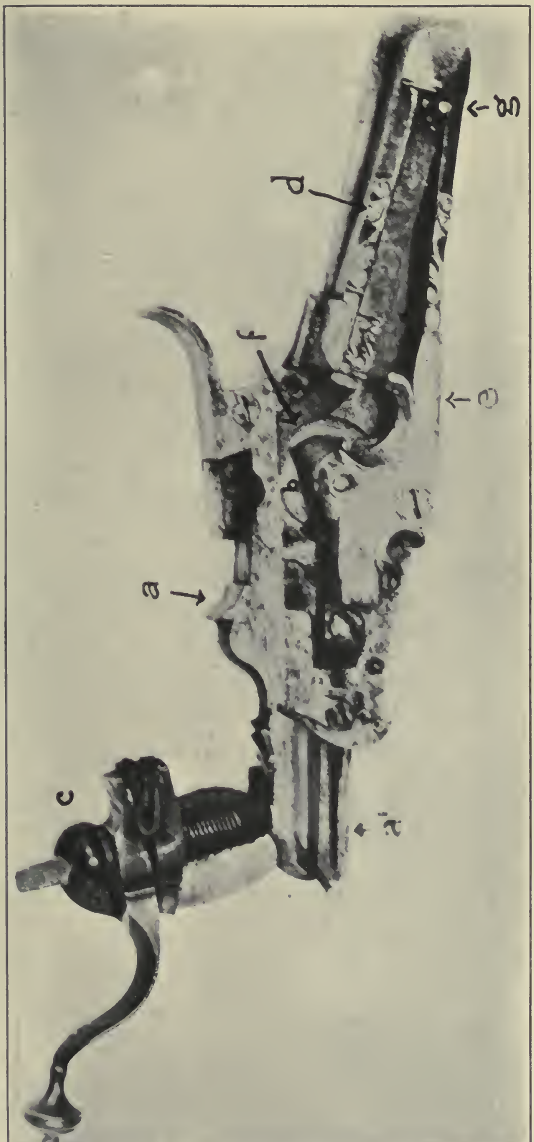


Plate No. 4. — The Interior of the Lock of the Wheellock Rifle

SNAPHANCE MUSKET

PLATE NO. 5, *a*

Length 5 ft. lacking only $\frac{1}{4}$ of an inch; length of barrel 3 ft. 8 in., caliber about $\frac{11}{16}$ of an inch, taking 12 balls to the pound loosely. Lock plate $5\frac{3}{4}$ inches long. The wood seems to be beech or birch, and is fine grained and exceptionally hard. Seven inches of the rear of the barrel are octagonal. The mountings are brass, and the lock has a brass pan, which has on the outer side a large fender capable of being swung perpendicularly on a pivot at the rear, and shown half raised. The musket was made at St. Etienne, France, and bears on lock, stock, barrel, bayonet, and ramrod the old-style St. Etienne proof-marks. As it is not marked Manufacture Royale, it may have been made before 1669; on the other hand the fact that the separate parts bear proof-marks seem to indicate government manufacture, which would set the date between 1669 and 1717, because the model 1717 musket was true flintlock with gooseneck cock. This musket was probably one of a quantity purchased by the Colonists as common property arms; most likely, all things considered, in anticipation of either the Pequot War or King Philip's War.

[G.E.M.] COLONIAL FLINT MUSKET

Plate No. 5, *b*

Length 4 ft. 11½ in., length of barrel 3 ft. 7 in., caliber about $\frac{13}{16}$ of an inch. Length of lock plate 6¾ in., marked G E M in a rectangle; no other marks. The butt plate is bronze while the mountings are of brass; when new the gun was probably without a butt plate. The wood is American black walnut. The barrel and its tang appear to be of American make. The lock was probably imported; maker's initials unidentified. The ramrod tip is ivory or bone. Period perhaps previous to 1700.

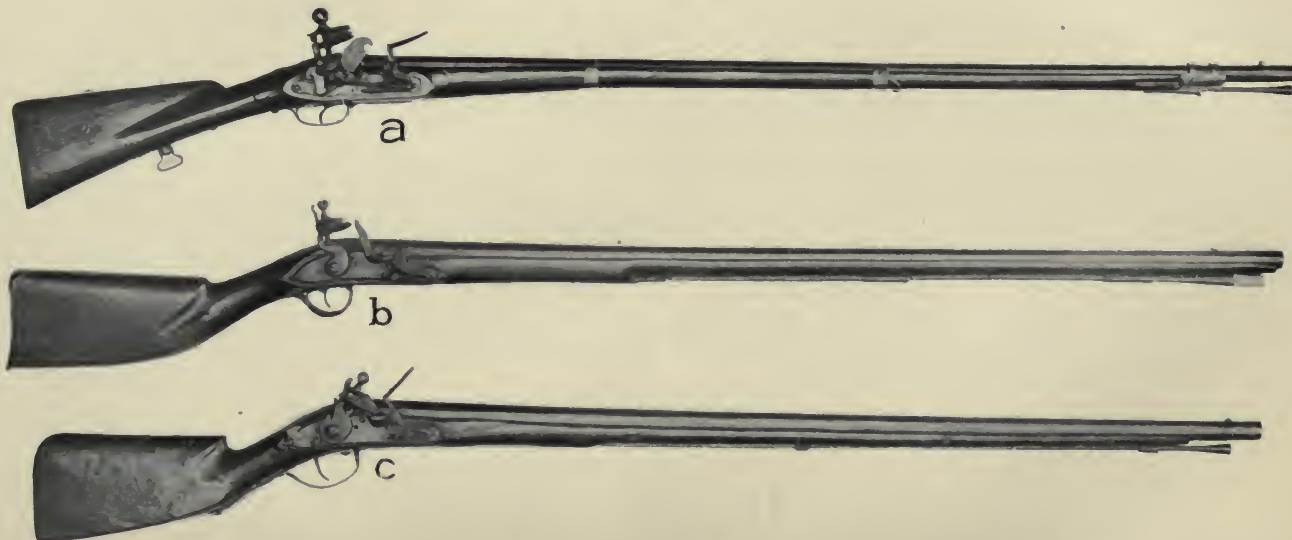


PLATE No. 5. — *a.* Snaphance Musket. *b.* [G. E. M.] Colonial. *c.* Colonial Queen Anne

COLONIAL QUEEN ANNE MUSKET

Plate No. 5, *c*

Length 4 ft. 9½ in., length of barrel 3 ft. 6 in., caliber about $\frac{13}{16}$ of an inch, taking 8 balls to the pound. Length of lock plate 7¼ in. The wood seems to be Honduras mahogany. The mountings are of iron, except the thimbles which are brass. They may not be original. The stock was made without a butt plate. The barrel is half octagon, and bears the old London proof-marks. The lock is marked with a broad arrow, A. R. for Anne Reina, and the maker's name, nearly obliterated. The cock has a safety clutch; this, the cock, and the lock plate are flat. The lock is held by three side pins (screws). The breech-pin has its head in the wood within the trigger guard; there is no trigger plate. This is apparently a gun stocked and assembled in the Colonies at Colonial expense in the period 1702–1714, using lock and barrel furnished by the mother country as a part of England's share in the expense of arming her Colonial militia against the French. Probably made in the Massachusetts Bay Colony.

(ORR?) COLONIAL FLINT MUSKET

Plate No. 6

Length 4 ft., $10\frac{1}{2}$ in., length of barrel $43\frac{3}{4}$ in., bore $\frac{3}{4}$ of an inch, length of lock plate $6\frac{3}{4}$ in. Weight of the gun about $9\frac{1}{4}$ lbs. The mountings are of brass, and are rather thinner and lighter than are to be expected. The wood seems to be red birch, and the wooden ramrod seems to be of split oak, with a tip of deer's horn. The butt is three inches thick and of parallel thickness, as if sawed from a plank. The general appearance indicates serviceability and economy. This gun has all the "earmarks" of Colonial manufacture. While in type it conforms to English and Continental European arms of the period 1650 to 1700, it is, if of Colonial make, probably of somewhat later date. Unfortunately all the marks (except a number) are so eroded as to be almost unrecognizable. There is, however, on the lock what appears to be 1 and 7 as parts of a date, and on the barrel parts of ORR are more or less distinct. It is probable that this is one of those 500 muskets made in 1748 by Hugh

Orr, of Bridgewater, Massachusetts, for the Province of Massachusetts Bay. A few of them were kept by the militia officers in their houses; the most of them were stored in Castle William in Boston Harbor and carried away by the British in 1776.

See Revolutionary period flint muskets made in Colonial times.

COLONIAL FLINT MUSKET

PLATE NO. 6

Length 4 ft. $9\frac{1}{2}$ in., length of barrel 3 ft. 6 in., caliber $\frac{11}{16}$ of an inch, taking 14 balls to the pound. Length of lock plate $5\frac{3}{4}$ in., sporting style, no marks. Wood seems to be maple. No butt plate. Barrel and tang Brown Bess style. Brass mountings. Colonial make, perhaps lock included, period probably before 1750.

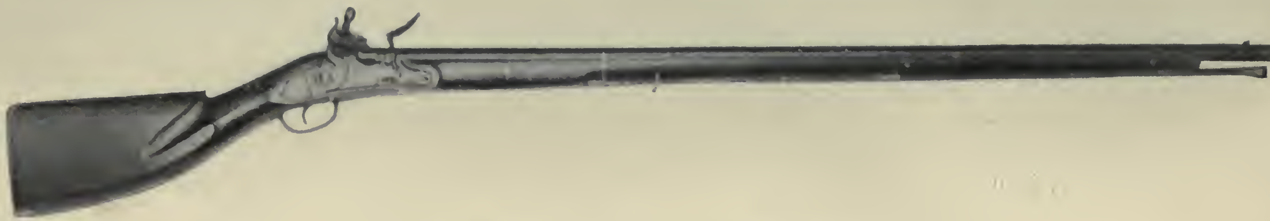
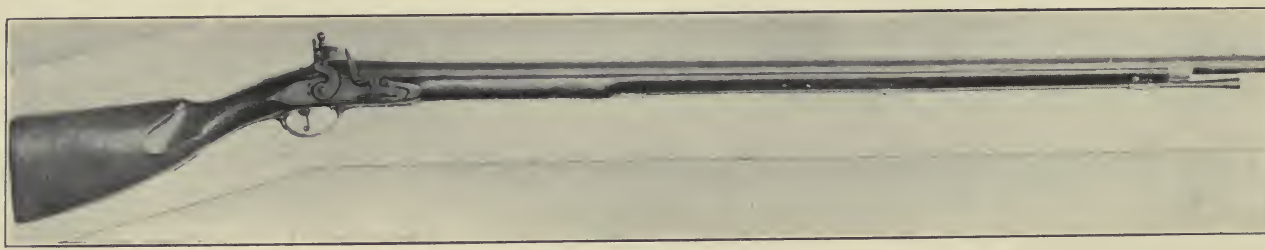


Plate No. 6. — (Orr?) Colonial Musket



Colonial Musket

Plate No. 7. — Elegant Combination Military and Sporting Piece

ELEGANT COMBINATION MILITARY AND SPORTING PIECE

Plate No. 7

Length 5 ft. 9 in., length of barrel 4 ft. 5½ in., caliber about $\frac{13}{16}$ of an inch. Length of lock plate 7 in. This arm weighs about 15 lbs. The outside diameter of the barrel at the breech is 1⅝ in., an unusual size. The wood is curly maple. The mountings are of brass, particularly elegant in form, and the side plate is perforated and carved in scrolls. The butt plate, instead of being secured in the usual way by screws, is fastened by many small hand-made nails forming a row all around the edge. While of musket dimensions and general form the arm is not made to take a bayonet, and is handsomely carved and finely made. When new it was a very expensive piece, suitable for a governor, patroon, or other dignitary. Its date was probably about 1700–1730, and it was most likely made in the Massachusetts Bay Colony.

LONG FOWLING PIECE

Plate No. 7

Length 6 ft. $1\frac{1}{2}$ in., length of barrel 4 ft. $8\frac{7}{8}$ in., caliber about $\frac{5}{8}$ of an inch. The wood is apple or pear and has a handsome grain. The lock is stamped on the inside "Ketland." The mountings are of brass. The top of the barrel has three narrow flats the full length. The ramrod is of hickory. This fowling-piece is believed to have been made by Jeremiah Smith, of Lime Rock, R. I., prior to the Revolution. It is almost like new. In spite of its great length it is light, well balanced, and very handy.

Plate No. 7. — Long Fowling Piece

WHEELLOCK PISTOL

Plate No. 8, *a*

Length 25 in., length of barrel $16\frac{1}{2}$ in., caliber about $\frac{9}{16}$ of an inch. Wood inlaid with ivory, richly engraved. Wheel let into the thickness of the lock plate from the exterior, and covered. Pan has sliding cover. Armorer's marks unknown; ornamentation indicates German make. Appropriate to Colonials of rank, period up to 1650.

WHEELLOCK HOLSTER PISTOL

PLATE No. 8, *b*

Length $23\frac{1}{2}$ in., length of barrel $15\frac{3}{4}$ in., octagonal; caliber $\frac{9}{16}$ of an inch. Mountings of iron. The armorer's marks, a bird in a shield over M S, have not been identified. The tang pin (screw) has its head in the wood of the under side of the pistol and passes upward to thread into the tang; this is the reverse of the usual position. This is a plain, strictly military pistol, one of a pair just alike. It is a typical piece of the wars of Charles the First and The Commonwealth, and also of the period in Colonial history from 1640 to 1700. Since flint was almost immediately substituted for iron pyrites, which was first used in wheellock arms, wheellock arms would class with the flint arms with which the Colonial authorities directed the soldiers to be armed "if possible." The wheel is on the exterior of the lock plate. This is the sort of pistol mentioned in the schedule of prices fixed by Charles the First as "fire lock, £3 the pair."

SNAPHANCE PISTOL

Plate No. 8, *c*

Length about 15 in., length of barrel 9½ in., bore about ⅝ of an inch, weight about 2½ lbs. Marked on the barrel Lazarino Cominazo. The stock, of wood so age-darkened as to be unrecognizable, is handsomely carved. The mountings are of brass, beautifully formed and engraved with the highest skill. The exterior of the barrel is beautifully modeled, and decorated with both longitudinal and spiral ribbing. The ramrod has a fancy tip of steel. On the left side of the pistol a steel band extends between the side pins, to support a belt hook. The weapon is a very elegant one, and was, when new, one of a very expensive pair. There were two Lazarino Cominazos, father and son. This arm was probably made by the son, sometime between 1680 and 1720. The productions of both rank among arms as Raphael pictures do among paintings, and are greatly prized by such European museums as possess them. A generation or more ago the Duc de Dino collection held the greater part of all the Cominazo arms known to be in existence, and a part of those Cominazo arms are now held by the Metropolitan Museum of Fine Arts, in New York. This particular pistol probably came to America with some early titled French refugee, and may have served in any or all of the Colonial wars.

SNAPHANCE DAG

PLATE NO. 8, *d*

Length 17 in., length of barrel 10¼ in., caliber of belled muzzle $\frac{13}{16}$ of an inch. Apparently of Spanish make, monogram of armorer unrecognized. Wood unknown, very fine, dark, and glossy. Mounted in silver, which is cut, perforated, and engraved in rich designs. The barrel is inlaid with several metals. The ramrod is of wood, with wormer, ball tip, and holding spring. The design of the belt hook is peculiar to this style of pistol. The Dag type of pistol was made particularly in Scotland, Spain, and Germany, was particularly suitable to elaborate decoration, and was the favorite show weapon of people of rank and wealth. Like the Highlander, it is a distinct type. In Colonial days it formed part of the arsenal of such men as Governors Andros and Dunmore, Oglethorpe, Lord Baltimore, and the Patroons of New Amsterdam. It was a favorite weapon with the Spanish grandees in the New World, and an equally favorite weapon with the pirate captains who captured them.

Famous Makers of Scotch Dags

John Lokhart, 1604; John Hamiltown, 1610; John McClellane, 1611; John MaKclellan, 1626 (the same?); William Black, 1625; William Clerk, 1626; James Clerk, 1626; William Walker, 1626; John Auchinleck, 1629; John Reule, 1629; Robert Smyth, 1629; George Bruce, 1629; Thomas Bruce, 1632; Gilbert Williameson, 1634; Robert Bear, 1643; Michael Achisone, 1646; John Millar, 1647; John MaKalaster, 1649; Alexander Logane, 1658 Alexander Logone, 1670 (the same?); William Mitchel, 1658; James Wilson, 1666; James Miller, 1668; Robert Orr, 1674.

SEMI-BATTERY FLINT PISTOL

Plate No. 8, *e*

Length 16 in., length of barrel 10 in., caliber $\frac{11}{16}$ of an inch. Barrel half octagon. Wood carved and stippled. Mountings gilded and engraved. Lock and cock flat faced. Barrel and lock etched. Small belt hook. The frizzen and the pan-cover are entirely separate; the latter slides backwards and forwards by hand as on wheellocks. The pistol belongs to the transition period between snaphance and fully developed flintlock. It seems to be of Italian make, and is such as a Colonial officer or a person of means used about 1600, before and after.

PLATE No. 8

FLINTLOCK POCKET PISTOL

Plate No. 8, *f*

Length 7 in., length of barrel $3\frac{1}{8}$ in., caliber $\frac{7}{16}$ of an inch, weight about 7 oz. This shape of pistol is called the Bird Head, from the form of the butt. Bird Head pistols were made in both Europe and America, and were popular in Colonial times. The tiny lock to this pistol is only $3\frac{1}{4}$ inches long, but is in every way complete. It seems to be of French make, while the rest of the pistol was probably made in America. Its date may be previous to 1700.

See in the Revolutionary period, Highlanders and other Colonial pistols used during the Revolution.

THE REVOLUTIONARY PERIOD

(1775–1783)

In the interval between Pontiac's War and the Revolution the Colonies grew rapidly. Large families of children, and a constant influx of immigrants, were increasing the population from about two millions in 1763 to about two and a half millions in 1775, counting freemen, indentured servants, and slaves. Game was abundant everywhere, and hunting, except for residents of large towns, was an almost universal diversion. As a whole, the people were skilled in the use of firearms, and the firearms industry flourished when other industries languished.

Several regiments of British troops arrived in 1766 at New York, and in 1768 several more at Boston, bringing an abundance of work for the resident armorers. Some of the British officers brought their horses, dogs, and fowling-pieces, others purchased in America, and the pursuit of both large and small game became a favorite means of passing away the time. In 1769 the merchants of Boston created a fund for carrying on a manufactory of

guns and small arms, as the demand warranted an extensive output.

In 1769 Daniel Boone made his first trip into Kentucky, and by 1775 the migration to Kentucky and the Ohio country was like a constant succession of small armies. The Indians being hostile, every male white who was able to point a gun carried one, and left behind him the price of a gun, rifle, or a pair of pistols.

In 1774 a Philadelphian wrote to a member of parliament that there were sufficient gun makers in the Colonies to make 100,000 stand of muskets per year at 28 shillings each, and powder was already made. Yet, although the Revolution was imminent, and the need of a store of firearms apparent, the home consumption was such that the outbreak of hostilities found the Colonists poorly provided. This negligence on the part of the Colonists seems inexcusable.

For more than a year the outbreak of hostilities was expected daily. Committees of correspondence had been active, and a union of the thirteen Colonies against the mother country was assured; there was no national government, no executive, yet each Colony for self-protection should have established armories, — and did not. In New England small stores of ammunition and old guns were collected

from the people and from old town supplies stored since the French wars or before, but the main reliance seems to have been upon the personal property arms which existed in almost every household throughout the land.

The militia throughout the thirteen Colonies became active; and training, such as could be done by inefficient officers and by efficient officers whose neighbors in the ranks considered themselves on equal terms with their commanders and privileged to use their own judgment whether to obey or not, — such training was, particularly in Massachusetts, a matter of almost weekly occurrence. Some good came out of it; not as much in the way of military efficiency as in enthusiasm for the cause, worked up to high pitch by frequent discussion of the injustice which the Colonial soldiers felt was being practised upon them.

A year before war began Great Britain prohibited the exportation of arms to the Colonies; still, with war imminent, no preparations worth while were being made. Some of the public men of the time voiced the belief that bloodshed would be averted. Whether or no, the Colonists were waiting for Great Britain to fire the first shot.

The outbreak of war came with Major Pitcairn's pistol shot at the "minute men" upon Lexington

Common, and there was no lack of the activities of warfare thereafter.

The battle which followed the discharge of Pitcairn's pistol — the battle of Concord and Lexington, picturesque in incidents, invigorating to the American cause, shocking to British assurance and pride, deadly to about two hundred and seventy-five trained British soldiers and only about one third as many Colonial rebels, was not one which set a standard of American shooting ability. Neither was Bunker Hill, which followed less than two months after, where the trained British regulars lost more than ten hundred and fifty as good men and officers as ever charged a redoubt, while the Colonial militia lost less than four hundred and fifty, and with sufficient powder would have had a still smaller loss and victory too.

These were cases where the British contempt for their uncouthly dressed and armed "peasant rebels" caused them in their pride to waive precautions, and the American farmers accepted the British lives offered them almost upon the muzzles of their guns. Protracted wars do not consist of such opportunities and such slaughters. The British became careful afterwards, and thenceforth the Americans had to rely upon skill.

During the whole of the war, which was carried

on with a great multitude of engagements from 1775 to the capture of Yorktown by the Americans in 1781, there was in the United States a more woful condition of dissension, incompetency, dishonesty, jealousy, lack of government, and distressing poverty than can be appreciated after a lapse of far more than a hundred years. It is doubtful if even the newspapers, diaries, and records of the times can now represent with sufficient vividness the miserable condition of affairs. Yet the war went on. And it lasted, actively, for about six long years. And it ended in victory for the American army; victory for a very weak new nation; defeat for a powerful old nation. Naturally such an outcome caused then and afterward very close study of all the military, economic, and political aspects of the conditions then operating for and against both nations.

It has long seemed safe to decide that American victory was due to foreign intervention. France, after the Americans won the important battle of Saratoga in 1777, assisted America directly with loans of money, sales upon credit of munitions of war, and with French troops upon American soil. France, Spain, and the Netherlands, combining, threatened Great Britain in Europe. Hence Great Britain, after losing the army which surrendered at Yorktown, being weakened in America and also

feeling that peace with America was the price of safety at home, gave up the struggle; renounced her rights to govern two and a half million Colonists; presented them, so to speak, with the immense territory which they occupied, with all its agricultural, mineral, and commercial wealth, present and future. It was a tremendous present; not a gladly given one but an enforced one. In spite of France, Spain, and the Netherlands, Great Britain would not have given up America, if America, disorganized and poverty-stricken, could have been conquered by force of arms.

But, in the fighting that had occurred between 1775 and 1781, Great Britain had noted that her loss of life in battle had been as five British soldiers to three American soldiers. Also, France had refused open aid until America won Saratoga. Hence another aspect to American success, and the questions — why or how was the Battle of Saratoga won, and why was British loss of life in battle so much greater than American that the people of England besought Parliament to end the war?

It is not sufficient to make a general statement that at Saratoga and before there were fewer mistakes in American strategy, and that during the war the American soldiers showed themselves superior with the gun or the bayonet. In the first place, strategy,

great as is its power of influence, is only one element of the many that affect the outcome of a battle or a war. In the second place, given two Revolutionary soldiers armed with muskets, marksmanship counted little, as the inaccuracy of the weapons beyond very short range negatived the human element of marksmanship; while prowess with the bayonet at close quarters would be a British asset, not an American, for there was never a time when one half the American soldiers were equipped with bayonets.

So the vital question of why the Americans won needs a more detailed answer. And since all other causes influencing the outcome have been minutely examined and passed upon, the weapons in use by the opposing armies, which have so far been neglected, merit examination. Was the war fought with muskets?

Unquestionably the two engagements which opened the Revolution were fought at the muzzles of muskets and fowling-pieces — smoothbores of equal efficiency at the muzzle and equal inefficiency at long range. In the same opening movements of the war were the expedition to Canada, occupying the fall and winter of 1775, the skirmish at Great Bridge, December 9, 1775, the skirmish at Moore's Creek, February 27, 1776; and the siege of Boston which resulted in its evacuation by the British March 17, 1776. In each case

the statistics indicate light American loss, heavy British loss (the most excessive ratio was at Great Bridge, Americans nothing, British 61), while the conditions in each case were not such as, at the running fight from Concord and the Battle of Bunker Hill, favored the American militia. Here are indications of precision of fire, and there comes to mind the remarkable weapon evolved by the mid-Colonials and used in small numbers to great effect in the French wars — the rifle; it was used in those early fights. And, further, all that could be had were used on every occasion throughout the war. To the limited number available is due, in a sense, the prolongation of the war, and there is abundant evidence that had the Colonists been a nation of riflemen the war would have been quickly over. Washington and the Continental Congress strained every nerve to increase the number, but the gunsmiths who knew how to make them and the men who were skilled to use them were confined to a limited area and were a small minority.

The first considerable mention of riflemen in the American army occurs in connection with the siege of Boston. When the news of Concord and Bunker Hill was spread throughout the Colonies by post riders, and the Continental Congress realized that war had really begun and that the British stronghold of Boston was to be a seat of war, messengers

on horseback were despatched into the sparsely settled western borders urging the pioneers to assemble and help in the fight against oppression. Congress could not offer them a reward, nor even guarantee them pay, for it had no funds, and no power to raise money by loan or by taxes. But the mid-Colonial pioneers were born and bred to fighting and, self-equipped, they responded with alacrity in numbers greater than were called for. In several divisions they were started on the long journey afoot to Boston. As they reached the large towns on their way they stopped a little while to give exhibitions of their skill to hearten the inhabitants and develop enthusiasm for enlisting. Accounts of some of these exhibitions written by eye witnesses found their way into the newspapers. The Virginia *Gazette* of 1775 said: "On Friday last there arrived at Lancaster, Pennsylvania, Captain Crescap's company of riflemen consisting of 130 active and brave young fellows, many of whom were in the late expedition under Lord Dunmore against the Indians. These men have been bred in the woods to hardships and danger from their infancy. With their rifles in their hands they assume a kind of omnipotence over their enemies. Two brothers in the company" (probably the Shain boys who were celebrated as marksmen and for recklessness) "took

a piece of board 5 inches by 7 inches with a bit of white paper the size of a dollar nailed in the center, and while one held the board upright gripped between his knees, the other at 60 yards without any kind of rest shot 8 balls through it successively and spared his brother's thighs. Another of the company held a barrel stave close against his body perpendicularly while one of his comrades at the same distance shot several bullets through it. The spectators were told that there were upwards of 50 persons in the company who could do the same."

There is also contemporary mention that three of Captain Crescap's men fired simultaneously at a buzzard flying high overhead. The bird fell, and each man claimed that he had killed it. Examination proved that all three bullets had hit their mark. On the 18th of July the first company (Nagel's, of Berks County, Pennsylvania) arrived at Boston, and by the middle of August 1430 instead of the 810 required reported there for duty. They were placed under the command of Col. Wm. Thompson of Carlisle, Pennsylvania, organized as light infantry, and assigned to duty in the besieging army. Shortly after Washington took command of the army he arranged a spectacular review of his riflemen, that the fifteen or sixteen thousand New Hampshire, Massachusetts, Rhode Island, and

Connecticut militia who had assembled to shut the British up in Boston might see the novelty of accurate shooting at what to them was extraordinary distance, and be encouraged and stimulated thereby. It is probable that to New Englanders (with the possible exception of some of the Green Mountain Boys and a very few veterans of the French wars who had served with mid-Colonials) the rifle was then unknown. In the presence of the army, drawn up in parallel lines each side of the range and an immense crowd of spectators, in which a number of British spies were welcome visitors, a pole 7 inches in diameter was set up, and a marksman stepped off 250 spaces. At the place where he stopped a company of riflemen was lined up to show what they could do. The mark was about equal to that a man would present standing sideways, and the range about 200 yards. No New England farmer would waste powder and ball firing at such a mark and distance with his musket or fowling-piece — only luck could account for a hit. But the riflemen, firing singly or at command, so riddled the pole that it was apparent that no enemy could survive an instant. General Howe, cooped up in Boston, was fully as much impressed as the spectators, and wrote home about the "terrible guns of the rebels." In the army around Boston the riflemen were employed

as sharpshooters to pick off any British soldiers or officers who were incautious in exposing themselves. This they did to perfection. There is mention of a British soldier shot at 250 yards when only half his head was visible; of ten men, three of whom were officers, killed one day while reconnoitering; of a rifleman who, seeing some British on a scow at a distance of fully half a mile, found a good resting place on a hill and bombarded them until he potted the lot.

And so on, until General Howe, thinking that his statement of casualties and American marksmanship might need proof at home, gave orders for the capture alive of one of the curiosities complete with his shooting-iron, and offered a reward. Finally he got one and sent him to England rifle and all, and the marksman was made to perform there and exhibited as a curiosity. This bit of stage-play had an effect upon the British public that perhaps Howe did not anticipate — and perhaps he did, for he was accused of being lukewarm to the King's policy — that of frightening the British public, through the newspapers, to such an extent that enlistments in the army, difficult to get before, absolutely stopped for a period, and the only new recruits were those forced into service by the German princes of whom King George the Third hired them.

The King had probably forgotten all about his Colonial marksmen of the earlier war, but speeches in Parliament frequently voiced the national dread of the deadly American weapons, and the King took notice. In his negotiations with the German princes he stipulated that as many of the recruits as possible should be riflemen. He evidently tried to treat the problem broadly, on the principle that as there were only two places in the world — the Colonies and Central Europe — where rifles were used, no new recruits being possible to the Colonists, an equal number of European riflemen would neutralize them. The fault in his reasoning lay with his ignorance of the fact that the American rifles were infinitely the superiors of those he was hiring.

While the unwilling German conscripts were being sent to the slaughter, the campaign in New England had ended, and that of the Hudson had begun. The campaign opened with the immediate loss to the Americans of Long Island and New York City. The battle of Long Island seems to have been a musketry one, and the only mention of riflemen there or in the skirmishing for the possession of the small forts above New York City is in regard to Washington's distress as, standing upon the west bank of the river, he saw on the opposite side a body of Hessians charge up the slopes below Fort Wash-

ington and pin to the trees with their bayonets a few straggling sharpshooters outside the works who were trying frantically to reload their rifles. Where those backwoodsmen who had spread death and fear at the siege of Boston were at this period of the war is a mystery. It is probable that, their term of enlistment having expired, they had gone to their homes. Their next appearance of moment was in the decisive battle of Saratoga. The German riflemen appear, however, before that event, and most of them disappear too.

The British General, Burgoyne, following the waterway down from Canada, needing supplies and horses, and hearing that the Americans had gathered a store of each at the little Vermont village of Bennington, sent five hundred Germans armed each with a rifle and a big saber, about a hundred Indians, and a couple of cannon, to gather them in. These troops, together with a reinforcement of five hundred more Germans and two more cannon, were surrounded, killed and captured, together with their munitions, by the Green Mountain Boys on the 16th of August, 1777, with casualties to the Americans of only 56, while the killed and wounded among the Germans amounted to more than two hundred. Since the Americans used mostly muskets and fowling pieces, the inefficiency of the European rifle is dis-

tinctly apparent. And, as in addition to the two hundred killed, about seven hundred were captured, the influence of German marksmen upon the Revolution is inconspicuous thereafter.

At some time between the Battle of Long Island and the Battle of Bennington, Daniel Morgan was organizing his famous Virginians. This was a rifle regiment formed of skilled marksmen. Noted shots were drawn from other regiments: applicants for admission whose fame had not preceded them were obliged to give proof of their skill. Thus not only superior soldiers but superior arms were collected under an able leader.

Morgan had won a great reputation for bravery and resource in the French and Indian War. He was of Welsh descent, a native of New Jersey, but a resident of Virginia; his stature and his tenacity of purpose were equally immense; he was uneducated, but he had a clear and strong intelligence. With his Virginians he arose from obscurity to international fame. Before the close of the war Frederick the Great spoke of him as "the greatest leader of light infantry in the world."

Morgan's Virginians were certainly organized by the time the news of the victory at Bennington reached Washington near Philadelphia. Washington was too busy there to be able to leave; the situation in the

North, however, still looked critical to him. The Battle of Oriskany, which had been fought on the 6th of August, hand to hand, tooth and nail, with heavy loss to each side, looked doubtful in its effect: the flight of the British General St. Leger and the capture of his stores had not taken place, and the junction of the armies of St. Leger and Burgoyne looked to Washington both probable and menacing. In this extremity he turned to Morgan and sent him in haste to the seat of war. Morgan and his riflemen arrived in time to dominate the battles at Stillwater, which caused the surrender of the British army at Saratoga. In the first day's fighting, Morgan's advance fell upon Burgoyne at Freeman's Farm and checked his progress. For eighteen days following Burgoyne remained hemmed in, inactive, undecided what move to make next.

On the 7th of October he began a battle. As the British moved on, their right under General Fraser, who was regarded as one of the best officers in the British service, was attacked by Morgan's men. After a short, sharp fight their whole line was broken and Fraser began forming them a little farther back, and on the west border of Freeman's Farm. Morgan saw that a disheartening blow delivered then would not merely shatter that particular division of the British, but also would imperil the whole British

army. Calling to him Tim Murphy, a Northumberland County Pennsylvania hunter, he said to him that the success of American arms demanded the death of General Fraser, and, pointing him out to Murphy, ordered him to do his duty. Murphy climbed a tree and, resting in a crotch, aimed his rifle over a limb. Fraser was about three hundred yards away, sitting his horse with an orderly beside him and one behind, and quietly directing the movements of his men. Murphy fired two shots in quick succession from his double-barreled rifle. The first cut Fraser's bridle rein near his fingers; the second passed between him and the man beside him and killed the man behind. Fraser was perfectly aware that he was being used as a target, and had even seen the flashes in the tree before the bullets struck. His subaltern implored him to move to a place of safety, but he chose to remain. In a few moments there was another flash from the tree, and Fraser received a mortal wound. In the confusion following his fall, the British position was taken in reverse and made untenable. Nothing was left for Burgoyne but to get the wreck of his army out of the way by retreating to Saratoga. There, surrounded, hungry, thirsty, and daily thinned by the deadly American rifles which sought them from across the river, the British were obliged to surrender.

Up to that time there had been no open help; no foreign intervention. After that victory there was foreign assistance, by help of which the war was dragged on to a favorable conclusion. Success at Saratoga was therefore the hinge upon which the Revolution swung. And the bearing point in that hinge was Tim Murphy's rifle bullet.

In the two years following, — the years 1778 and 1779, — military operations were less active than before, giving the Americans opportunity for drill and reorganization. Riflemen were sought everywhere, and formed into regiments. There were Morgan's Virginians, Colonel Samuel Miles's Pennsylvania Rifle Regiment, Colonel Moses Rawling's Maryland Riflemen, the Augusta Riflemen of Virginia, the Eleventh and Twelfth Continental Line, and perhaps others. Upon the killing efficiency of the gunnery of those regiments hung the failure or success of the Campaign of the South, the third and last campaign of the war.

Other smaller and less noted bands of riflemen were, while these regiments were being drilled by the systematic pupils of Baron Steuben, doing active frontier service, which then seemed of minor importance, but now appears of great value. Bands of pioneers operating upon the "Dark and Bloody Ground," were freeing it of savages and making a

great, fertile, and dangerous country a safe refuge for future settlement. Only the rifle could have so rapidly and effectively done the work. During the summer of 1778 bands of Tories and Indians devastated Wyoming Valley, Pennsylvania, and Cherry Valley, New York. Again the only effective weapon to put an immediate stop to wide devastation and continued horrible cruelties was the deadly rifle, and that was what General Sullivan, sent there to retaliate, employed. He totally destroyed the Indian settlements of the Onondagas, Cayugas, and Senecas. In 1778 and 1779 George Rogers Clark with a heroic band of only two or three hundred riflemen passed through an immense extent of country of the then Far West, captured the British posts of Kaaskasia, Cahokia, and Vincennes which had permitted British dominion of the territory, and hoisted the flag of the republic, marking the end of British authority in that section forever, and adding the territory to that of the United States.

In 1780 the final activities of the campaign of the South began. The British captured Charleston, South Carolina, with more than five thousand prisoners. Bad as was this loss for the Americans, it was not a mortal blow for the reason that loss by death or capture could be made up by new recruits. The British army in America could not, however,

well be increased, and whatever means tended to diminish it tended to make possible the capture of the weakened remnant. Working toward this end the guerrilla warfare of the marksmen under Marion, Sumter, and Pickens became a more valuable American movement than otherwise appears. Battles and skirmishes called British successes — Camden, for instance — were in reality rendered by American sharpshooters steps in ultimate British defeat by the severity of British casualties. In other battles — Eutaw Springs, Cowpens, King's Mountain, Ninety-six, Guilford Courthouse, Hobkirk's Hill, etc., — one-sided battles because the American troops were made up almost wholly of riflemen — the British losses were so excessive as to cause a repetition of Saratoga. Just as Burgoyne, after Stillwater withdrew his remnant of an army to Saratoga, and there, surrounded, saw no safety but in surrender, so, again, did Cornwallis, with the remnant of his obsoletely armed army, get caught at Yorktown. And, although his surrender at Yorktown was on the 17th of October, 1781, and peace was not declared until 1783, Yorktown ended the war.

The outcome of a war is influenced by an immense number of diverse factors, and a claim for the predominance of any one of them is a very difficult claim to maintain. During the Revolution the great

credit due to the wise Washington and to his able officers and self-sacrificing soldiers makes all other factors of success seem puerile. Yet an accurate analysis of the times and events makes necessary the recognition of all the diverse factors, and their classification as either political, economical, or martial. According to a historian's leaning towards one or other of these specialties, so do the others seem to sink into insignificance, and so accordingly is a dominant claim apparent in his especial presentation.

Firearm influence belongs to history in general and to economics in particular. Neither it nor any set of influences really stands alone in directing the progress of the world. Firearms have been, are, and will be of great importance as one of the many influences; they are mighty in their place; they are worthy of an attention that so far has been dormant; they are worthy of other, broader, and deeper studies than seem wise to attempt to present in the first rehearsal.

The omission of ordnance from among the firearms of early American history is merely because of its sameness then throughout the civilized world. The cannon of one nation neutralized those of another, weight, numbers, position, service, and luck being equal. In their development later they take an important place.

DESCRIPTION AND ILLUSTRATION

OF

FIREARMS OF THE AMERICAN REVOLUTION

The armies of four nations took part in this struggle: Great Britain, Germany, France, and America. The British Army was made up of English, Irish, Scotch, and Welsh subjects of King George the Third, all commonly called English, and the hired German troops forced into the war by their rulers the electors or princes of Brunswick, Hesse-Cassel, Hesse-Hanau, Anspach-Beyruth, Waldeck, and Anhalt-zerbst, all commonly called Hessians. The British Army in America totaled for a short time only about forty thousand; it did not generally exceed twenty thousand; the total number of Germans who came to America was twenty-nine thousand eight hundred and sixty-seven; the greatest number at one time did not exceed twenty thousand. The French Army, which came after the victory at Saratoga, numbered about four thousand; when reinforced by French marines and sailors during

the siege of Yorktown it totaled about seven thousand. The American Army consisted of troops put into the field by the Continental Congress, called Continentals, and state troops called Militia. There are no reliable records as to the total number of different soldiers who enlisted, or the greatest number enrolled at one time; careful sifting of evidence leaves indications that sixteen thousand and perhaps one or two hundred were the greatest number bearing arms at once. The navies of three nations — England, France, and America — coöperated with their armies. The American navy consisted early in the war of thirteen small vessels; they were soon destroyed and were not replaced; privateers did the sea service of America. The firearms used in the navies of England, France, and America, and on the American privateers, were not in any way peculiar to their service, did not differ from those used on land, with the possible exception that blunderbusses were used and rifles were not, did not of themselves alone, by peculiar fitness or unfitness, influence the war, and therefore need no classification. Also the arms used by deserters and by Indians in the opposing armies do not affect the general classification, as follows: —

English Army — muskets, a few rifles of one type, pistols. Navy — muskets, pistols, blunderbusses.

German Army — muskets, rifles (six to eight hundred), a few pistols.

American Army — muskets of many kinds and ages, fowling-pieces of infinite variety, rifles in great numbers and variety, pistols of all the flint kinds known. Navy — muskets, fowling-pieces, pistols, and blunderbusses — anything that would shoot.

French Army — muskets and pistols. Navy — muskets, pistols, blunderbusses.

Muskets of the English

The Brown Bess. — The principal arm of the British was the flintlock musket, then and later variously called Brown Bess, King's Arm, and Queen's Arm. Of these names Brown Bess is the oldest, and dates from Queen Elizabeth (Queen Bess), whose reign was 1558–1603. Long bows and cross-bows, not muskets, were the arms of the greater part of her soldiery, but she had one regiment equipped with matchlock guns with browned barrels and fittings; and as the custom of the times sanctioned giving familiar names to weapons the brown guns were named for the donor. King's Arm dates from William III (1689–1702), who at the Battle of the Boyne found flint muskets superior to other guns and caused their adoption in 1690 as the only regulation English military guns. The name was renewed under George I. Queen's Arm dates from Queen Anne's War (1702–1714). Although a matchlock, wheellock or snaphance British musket was in its day a Brown Bess, in Revolu-

tionary times the name was applied only to one with a flintlock.

The individuality of this arm is so strong that once it is recognized it is not easily confounded with another arm. Its characteristics cannot, however, be made thoroughly plain by verbal description only; they are more for the eye than the ear; the pictures will show some of them, but the arm itself would be better. In words there is possible only the broad statement that a Brown Bess differed from other flintlock muskets in these particulars: first, the barrel was fastened to the fore stock by pins, not by bands; second, the arm was mounted with brass; third and more important, the arm was marked by the British government.

Because this kind of gun was in use for more than 150 years; because different branches of the service were armed with different sizes of it; because through lack of machinery for making arms alike the hundreds of gun makers who made these muskets varied them a little to suit their tastes; because the early ones, the middle period ones, and the late ones were slightly unlike; and because so little is known about them, it is difficult for any but the most expert firearm antiquarian to judge whether or not a certain Brown Bess could have been used in the Revolutionary War. Illustration No. 10, *a* shows a perfect speci-

men of a Revolutionary War one, grenadier size, and *b*, *c*, and *d* show three perfect specimens of the smaller size used by light infantry, cavalry, and artillery, and preferred for sea service. Such small arms are occasionally mentioned in Revolutionary documents as carbines.

What the present owner of such an arm wants to know is not so much whether it was made before the Revolution as after it. As to the latter, when lacking a date or the maker's name, there is one certain proof, and only one: if the barrel has for a proof-mark a pair of crossed scepters with B G P in the angles the gun could not have been in the Revolution because the mark was first used in 1813. The BGP is the 1813 part of this mark; the crossed scepters without the letters were old. These were Birmingham proof house stamps. Other Revolution-time proof stamps were the London one, G P interlaced with a crown over, and also the private ones of such large manufacturers as Sharpe, Edge, D. Egg, Grice, H. Nock, the Ketlands, etc. The English laws regarding the proof of arms were lax, and private proofs were in some cases allowed instead of government ones.

Illustration No. 9 shows also the lock of gun, *a* — a typical lock. The marks on the lock plate are — "Tower," a crown with G R under it, and a broad

arrow. The word "Tower" means that the finished gun was inspected at the Tower of London by the agents of the government and declared by that mark to be a serviceable arm. A Revolutionary Brown Bess might, instead, be stamped "Dublin Castle," as that was the inspection place for arms made in Ireland. The large crown first appeared on firearms in the reign of Queen Anne, but apparently late in her reign; and under her successor, George I, it seems to have been the king's stamp, signifying that the arm was for the use of his subjects, — hence, again, the name King's Arm. The G R was an abbreviation for George Rex and the crown with G R was not only on a Revolutionary arm but also on those of all four Georges between 1714 and 1830. Until the fourth George these marks cannot be told apart. Not all the muskets stamped as described were issued to the standing army; very many purchased by the English government were sold to or issued to the militia, to the Colonies, and to privateersmen. Such, however, as were kept by the government were given another mark — the broad arrow (showing on the upper lock under the pan), signifying government ownership. This was put upon lock and barrel, appearing on firearms first in the reign of George I (1714–1727) and has been in use ever since. The head of the broad arrow was frequently stamped as

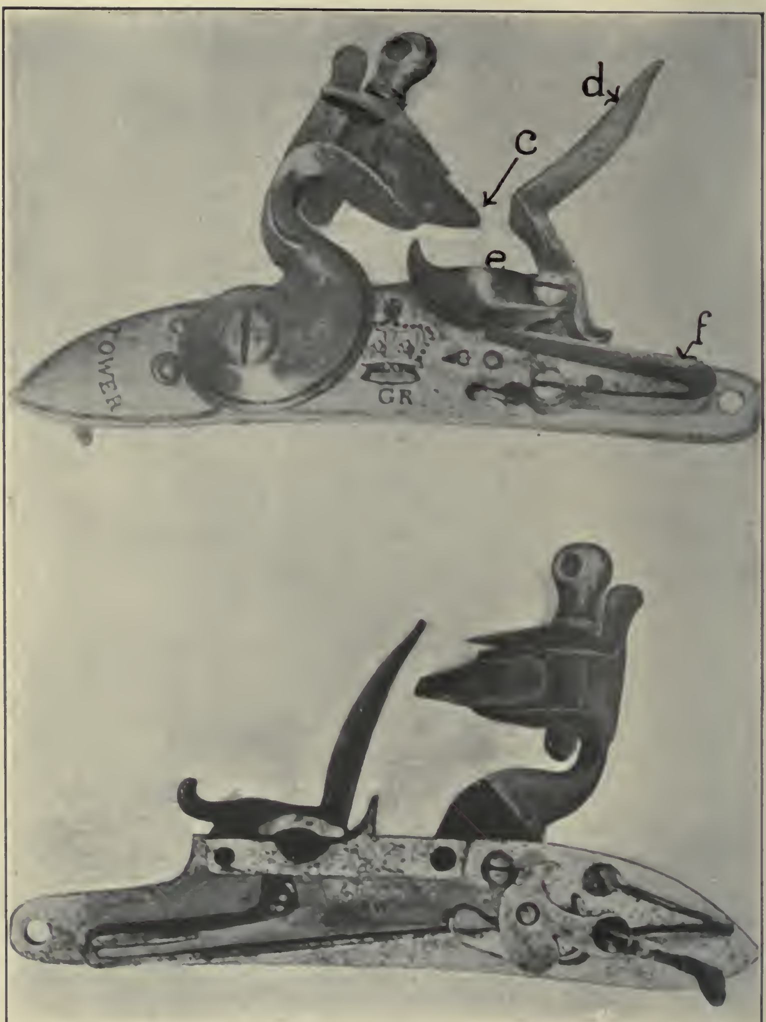


Plate No. 9. — Brown Bess Lock

shown in combination with a small crown. Inside the lock are various workmen's identification marks. In rare cases the name of the contractor appears on the interior, or on the exterior with the date. This flintlock operates upon the same principle as did all flintlocks used in the Revolution, firing the gun by means of sparks thrown into a pan of powder upon forcible contact of flint and steel. The flint (*c*) was held in the jaws of the cock. The steel was upon the face of the frizzen (*d*). The pan is marked (*e*). When the cock is drawn backward it is done against the resistance of a powerful spring situated upon the inner face of the lock. When the pan is covered the cover is held over it and the frizzen is held upright by the spring (*f*). Upon pressure of the trigger the cock strikes its flint against the frizzen and the frizzen falls forward at the same time, exposing the powder in the pan to the sparks. In muskets the frizzen and pan cover were usually one solid piece of hard steel, but in good sporting weapons (and some were used on the American side) the frizzen had a facing of correctly tempered steel which, when worn, could be removed by heat and another fixed on by soldering or brazing. A proper hardness of the frizzen was conducive to sparking, while an under or over tempered frizzen caused frequent misfires. Sparks from the flint and steel fired the powder

in the pan; the flash of the priming powder ran through a hole in the barrel from the pan to the chamber and fired the gun. All the parts of a lock have names. It is interesting that the word "screw" did not occur in connection with the flint gun: the screws were called "pins," of various kinds. The locks of the four Brown Bess muskets shown are each $6\frac{7}{8}$ inches long.

In Revolutionary days all metal parts of a musket were kept polished bright. The wood of a Brown Bess was usually black walnut — occasionally maple finished with oil, never with varnish. The greater part of these guns was not made in great arms factories, for there were only a few shops in London or Birmingham where muskets were made complete. As a rule a gun maker who had a government contract sub-let it to a number of journeyman workmen, each of whom made only one kind of part; thus, one man made stocks only, one made barrels only, one made locks only, etc., and each did his work at his cottage or in his little private shop in his yard. There were in Birmingham hundreds of these workmen, each of whom carried his manufactures to the shop of the contractor, where the assembling was done.

The soldier, to load his gun, half cocked it, and opened the pan by throwing forward the frizzen. Then he bit off the end of the cartridge, poured

the pan full of powder, closed it by snapping back the frizzen, dropped the butt to the ground, poured the rest of the powder down the barrel, struck the gun to jar some of the powder into the touch-hole, dropped in the ball, crumpled the paper and rammed it down to keep the loose ball in place. The piece was then ready to cock and fire. When the trigger was pressed, the cock in falling struck its flint against the frizzen, which caused the frizzen to fall forward and expose the powder in the pan, into which fell (perhaps) a shower of sparks. The priming powder flashed, the flash ran through the touch-hole and ignited the powder in the barrel, a jet of flame squirted out of the touch-hole and the charge went out of the barrel at the same moment. All this did not happen instantly, but occupied an appreciable interval of time during which the various operations could be observed. If a man was shooting towards the wind he had to take precautions against getting his face scorched and his eyes injured by the back-blown flare from the touch-hole.

These guns were very unreliable from two causes: First, the flint frequently failed to make sparks, or the touch-hole became stopped, or the fog or rain spoiled the powder. The second cause of unreliability was the total inability of the weapon to shoot accurately. And this again was from two causes:

First, the barrel being made by wrapping a sheet of iron around a mandril and welding the edges, which were sometimes butted and sometimes lapped, the interior of the barrel even after boring was anything but true. There was no desire on the part of the makers to put out accurately made barrels such as the famous Henry Nock was already furnishing on his double-barreled shotguns, because infantry regulations condoned inaccurate shooting. The soldier was merely required to hold his musket horizontal, point it — not sight it — towards the enemy, and fire at command. The execution of the enemy was entirely entrusted to volley-shooting at ranges not exceeding 100 yards. The other cause of inaccuracy was the bullet itself, which, wobbling loosely in the barrel or rolling along the bore as it was fired out, never, except by accident, went just where the shooter wished it to go.

"BROWN BESS" MUSKETS

a. Typical Grenadier or heavy infantry musket. French and Indian War (1754–1763) service also possible for this musket. Weight 10½ lbs., with bayonet 11½ lbs. Barrel 42 in., bayonet including socket 21¾ in., length of gun 4 ft. 9½ in., length of lock 6⅞ in. Caliber ¾ of an inch. Four ramrod thimbles.

b. Typical Light Infantry musket. French and Indian War service also possible. Used by infantry, cavalry, artillery, and navy. Lock 6⅞ in. long, and like that of *a.* Weight 9½ lbs., length 4 ft. 6½ in., barrel 39 in., caliber ¾ of an inch. Three ramrod thimbles. Name WILLETS inside of lock; he was a Birmingham gun maker. One of his muskets now in a collection bears date 1769. This gun said to have been carried by John Burnham, of Bolton, Massachusetts, Capt. Josh Brown's Company, Col. Tim Bigelow's Regiment from May 1, 1777, to December 8, 1780. Bayonet with gun.

c. Description of *b* fits this gun except for lock, which has oval-faced cock with reinforced under

jaw, and weight, which is 10 lbs. This gun is said to have been used at Bunker Hill, June 17, 1775.

d. Sea-service musket. A few were made especially for men-of-war on the rare occasions that the supply of regulation arms on hand was inadequate to sea-service demands. Weight 10 lbs., length 4 ft. 5 in., barrel 37 in., caliber $\frac{13}{16}$ of an inch. Two ramrod thimbles; front and rear ones of the regulation land service arm are omitted. Fore-end tip omitted. Butt plate flat instead of oval. The usual Birmingham Brown Bess barrel stamp of a small crown, crossed scepter, and G R, with or without the head of the broad arrow, is on this gun surmounted by the curved part of an anchor. Lock like that of *c*. Thick trigger guard and guard strap.

When fired with regulation charge from a horizontal position 5 feet above the ground the average flight of the ball before reaching the earth was about 125 yards.

Within the past five years several of these Revolutionary War Brown Bess muskets have been fired for testing purposes; guns that were as good inside and out as in the time of the war. The target was the figure of a man six feet tall drawn with chalk upon the barn door of an abandoned New England farm. If there was any choice between the targets

PLATE No. 10.—Brown Bess Muskets

it was in favor of this one; of ten successive shots from one gun at 100 yards six were misses, one struck the breast, one the knee, one the mouth, one the ear. That is, the effectiveness of the firing was only 40 per cent of hits at a target covering approximately 12 square feet, at a distance of only 300 feet. A modern military rifle fired at the same range at a target of only one twelfth the area should make 100 per cent. But whereas the modern rifle drills a small hole in a man so suddenly and cleanly that sometimes in the excitement of battle he barely feels it, the great round ball of the old musket smashed his bones, tore his flesh, let out his blood, and shocked him "hors de combat."

The picture No. 11, *e* shows that the one illustrated was large, heavy, and of a form already antiquated — similar to that of the Brown Bess of Queen Anne's War, 1702–1714. Arms of this kind were made in the gun-making cities of the Rhine, and of Belgium, and can be identified by the marks on the locks or on the barrels, since, unlike the English, the gun maker of the continent marked his arms with either his name or proof-mark, and frequently also with the name, arms, or mark of his city. These marks enable the firearm antiquarian to tell where, about when, and by whom a gun was made. Collectors are sometimes offered arms with the statement, made in all sincerity, "My ancestor carried this gun in the Revolution." The marks on the gun compared with those of the lists help to verify or disprove the statement. Many of the "Hessian" muskets were second hand, purchased as such of Frederick the Great by the petty German rulers. Some of them he had used in his own army and some he had captured. A German musket of the Revolution could also be a veteran of the Continental wars

of the preceding fifty years. The one shown is marked with a soldier's initials, and has three notches cut in the stock, perhaps signifying three men killed. The Germans may have had smaller muskets for their light infantry.

Grenadier Musket of the Hessians

Picture No. 11, *e*

Length 5 ft. 1 in.; barrel length $45\frac{1}{2}$ in.; caliber about $\frac{80}{100}$ of an inch; weight $10\frac{1}{4}$ lbs.; brass mounted.

MUSKETS OF THE FRENCH

While England and Germany relied for arms upon the output of their various gun makers, and used antique or new arms indifferently, France on the contrary had royal armories established since 1718 at St. Etienne, Charleville, Maubeuge, and Tulle, the combined output of which was sufficient to permit similar troops to be similarly armed. The arsenal at Tulle specialized on sea-service and colonial firearms. The best information obtainable indicates that the French grenadiers who assisted in the American Revolution were armed with the musket of model of 1763—see picture No. 11, *f*—while the light infantry, cavalry, marines, and navy had musketoons of model 1763. There is a bare chance that they had also some of the other models of muskets and musketoons designed between 1763 and 1777, but it is more probable that if any of these latter arms went to America during the war they were arms purchased and used by the Americans. (See, under Muskets of the Americans, Foreign Muskets.) The French muskets were superior to all others in strength, range, and accuracy. When fired with reg-

ulation charge from a horizontal position five feet above the ground the average flight of the ball before striking the earth was about 200 yards, or more than half as far again as that of the Brown Bess. This was due to the lighter ball, its closer fitting to the bore, and the more exact bore of the barrel. The accuracy of fire was, however, only slightly in excess of that of the Brown Bess, as precision of fire from a smoothbore was impossible. The superior strength of the French musket was due mainly to securing the barrel to the forestock by bands instead of pins, and to the strengthening of the cock by a connection between the fore part of the under jaw and the neck or weak place.

The Musket of the French, which is shown By Picture No. 11, *f*

Used by the Americans also. This one is the model of 1763, made at Charleville. St. Etienne and Maubeuge muskets of the same model were similar in generalities. This one weighs $9\frac{7}{8}$ lbs. Length 4 ft. $11\frac{5}{8}$ in.; barrel length $44\frac{3}{4}$ in.; bayonet length $17\frac{1}{2}$ in., including socket; caliber about $\frac{69}{100}$ of an inch, using 18 balls to the pound. Marks on lock—Manufacture de Charleville—engraved in script. Mountings of iron. The bayonet shown fits the gun and

is correctly stamped, but according to Bottet is model 1746 instead of 1763. See also under MUSKETS USED BY THE AMERICANS. *Musket Model* 1763.

Old muskets are liable to vary a little from the measures set by rule. It is inevitable, being made by hand, that slight variations in size and weights existed when new; many scourings have exaggerated them. In the St. Etienne and Maubeuge muskets the edge of a band which has two straps going over the barrel is curved between the straps, while that part is straight on a musket made at Charleville.

There is considerable old-time printed matter bearing on French arms of the flintlock period, but as the technical terms therein are not now in common use, nor even in modern dictionaries, the reader is greatly handicapped; hence the following: —

FRENCH-ENGLISH GLOSSARY OF FLINTLOCK FIREARM PARTS

âme ....bore
amorce ....priming
anneau du chien ......space beneath under jaw of cock
cœur " " .... " " " "
arbre du noix.........that part of the tumbler going through the lock plate
axe du noix ....that part of the tumbler going through the lock plate

assiette	that part of the frizzen which covers the pan
assise	" " " " " "
entablement	" " " " " "
table	" " " " " "
baguette	ramrod
bassinet	pan
battant	sling swivel
batterie	on the exterior of the lock plate of the true flintlock all the pieces except the cock and its parts
batterie	restricted meaning — frizzen
bayonette	bayonet
bouche	muzzle
bouterolle	thickened portion of the upper edge of the lock plate in rear of the pan
bride	bridle
busc	comb of the butt
canal	the recess in the wood for barrel or ramrod
canon	barrel
capucine	rear band
carabine	rifle
carré du chien	the square hole in the cock to receive the tumbler
chenapan	snaphance
chien	cock; in modern phrase, hammer
clou	nail
contre-platine	side plate
esse	" "
porte-vis	" "
corps de platine	lock plate
coude	elbow (of a bayonet)
coude du chien espalet " " support " "	the ledge on the left side of the cock which when the cock is down bears upon the lock plate

courroie . . . . .sling (strap)
crans du noix . . . . .half and full cock bents
crochets du noix . . . . . " " " " "
crête du chien . . . . .upper part back of the jaws of the cock
crochet de ceinture . . .belt hook
crosse . . . . .butt, stock
cuivre . . . . .copper: sometimes bronze or brass
culasse . . . . .breech-pin
débander . . . . .to uncock
détente . . . . .trigger
dos du chien . . . . .back part of the cock
douille . . . . .socket
embase . . . . .recess: reduced size
embouchoir . . . . .muzzle band
encastrement . . . . .the cut in the upper edge of a lock plate receiving a removable pan
face de batterie . . . . . . .the upright part of the frizzen
fendue . . . . .slotted
fusil . . . . .musket or gun
fût . . . . .fore end; fore stock
gachette . . . . .sear
goupille . . . . .pin in the shape of a slender long cylindrical bit of metal
grand ressort . . . . .main spring
grenadière . . . . .middle band
griffe du noix . . . . .tumbler hook
guidon . . . . .sight
laiton . . . . .brass
lame . . . . .blade (of a bayonet)
lumière . . . . .touch-hole
mâchoires du chien. . . .jaws of the cock
monture . . . . .the manner of setting of the metal parts in the wood
mousqueton . . . . .musketoon, generally carbine (smoothbore)

noix ....tumbler
pied de batterie ......that part of the frizzen taking the screw
pierre ....flint
pivot ....small cylindrical stud
pivot du noix ....the pivot on the tumbler entering the bridle
pivot de platine ......that thickened portion of the upper edge of the lock plate front of the pan
plaque de couche .....butt plate
platine ....lock
poignée ....grip, neck: part between rear of lock and front of butt
pontet................trigger guard
queue ....tang
queue de culasse ..... tang or tail extending back from breech
rampart de la batterie ..see pivot
ressort ....spring
ressort de batterie ....frizzen spring
ressort de gachette ....sear spring
ressort de garniture ...band spring
rivé ....riveted
sousgarde.............trigger-plate and its front and rear extensions when the guard is separate
taraudé ....threaded, speaking of a screw
tenon ....stud
tête de clou ....nail head
tire-bourre ....wormer
tonnerre ....breech
tourne-vis ....combination tool for screws and jaw screw; screw-driver; turn-screw
tringle ....on a carbine the rod upon which the swivel ring travels
trousse ....the tail piece of the frizzen which by contact with the spring prevents it from going too far forward

vis ....screw
vis du chien ....jaw screw of the cock
vis grande ....side pin, or screw securing the lock
vis du noix ....screw which holds the cock to the tumbler

MUSKETS USED BY THE AMERICANS

Brown Bess muskets were used more than of any other kind in the first year and a half of the war. Many were owned by the various colonies, counties, cities, and towns, and were issued to their militia: many an American soldier carried as his private property the Brown Bess of his father or grandfather: many were captured from the English on both sea and land and used against them.

Foreign Muskets. — The Continental Congress purchased from the Dutch, Spanish, and French West Indies and mother countries, and from Prussia, several thousands of muskets — anything that would shoot — old and new — assorted sizes and shapes. In the beginning France wished to appear neutral while at the same time giving aid, and secretly appointed as agents the commission houses of Rodrigue, Notalez et Cie, and Pliarne, Penet et Cie. From them came in March, 1777, the *Amphirite* to Portsmouth, N. H., bringing 12,000 muskets and the *Mercury* to Philadelphia with 11,000. This supply, added to those already in use, was sufficient to equip the whole American Army for the rest of the war.

These muskets were from the royal arsenals and armories, and were a mixed lot, containing scatterings of all the regular muskets — and perhaps musketoons — made between 1718 and 1777, with the model 1763 forming the bulk of the lot, and the very early and the latest models in very small numbers. Lafayette, coming in 1777, brought the Americans as a present a mixed lot of firearms, about 250 of which were muskets, and it is believed that the most of those muskets were model 1763, Charleville manufacture. Arms of that model and armory were and sometimes are now called Lafayette muskets. Of all the French muskets the model 1763 is most interesting to modern Americans, because it is the one the United States adopted as a model when the armories at Springfield and Harper's Ferry began to produce arms in 1795 and 1796. The model 1777 is also interesting, although to a less extent, because of its lock, brass pan included, being so far in advance — forty-five years — of the American adoption of the same design. All of the French musket models from 1717 to 1763 described under Colonial Firearms were doubtless in use by the Americans during the Revolution, with the possibility of their using also some of those between 1766 and 1777. There is more probability that these last were used by the Americans than by the French.

Musket Model 1763. Length 5 ft. less about $\frac{1}{8}$ of an inch; barrel $44\frac{3}{4}$ in.; caliber about $\frac{69}{100}$ of an inch; two barrel flats, one on each side at breech; bayonet stud but no sight on barrel; mountings in general similar to those of model 1754; the rear ring of the muzzle band bears a brass front sight, knife blade shape; lock plate flat faced; removable iron pan fastened by a pin (screw) on inner face of lock plate; pan has fence; exterior of pan has 3 flat faces and has forged strap connecting with pin; tail of frizzen curled up; flat-faced cock with under jaw strengthened by curved piece connecting with body. Weight 10 lbs; iron ramrod with enlarged head. According to Bottet bayonet has rear edge of socket thickened and strengthened by a roll, and a turning band to admit and then bind the stud on the barrel. Outline of under edge of butt and grip nearly straight. Sling swivels elliptical. No brass. (See illustration No. 11, *f*)

Musketoon (cavalry) Model 1763. Length 3 ft. $8\frac{5}{8}$ in.; barrel about 41 in.; caliber about $\frac{673}{1000}$ of an inch; the fore end goes almost to the muzzle; musketoons do not take a bayonet; bands, butt plate, and side plate of brass; both muzzle and middle bands are two-strap; forward sling swivel attached to middle band, rear one on under edge of butt; on left side an iron ring traveling on an iron rod extend-

ing between rear band and forward screw in side plate; iron ramrod with nail-head (sometimes called button) end.

Musket Model 1766. Differing only from model 1763 in having a thinner and lighter barrel and a spring fastened to the under part of the barrel to bear on the ramrod and hold it from slipping from its canal; bayonet like 1763 model except that a flat spring around the socket replaces the turn-band.

Musketoon (cavalry) Model 1766. Only differing from model 1763 musketoon in having an iron sight on the barrel, an iron rear band which is not in a recess, a short fore end leaving about $13\frac{3}{4}$ inches of barrel projecting, and no sling swivels, but on left side a ring traveling on a rod extending between rear band and side plate.

Musket Model 1768. Differs from model 1766 musket in being 4 ft. $10\frac{5}{8}$ in. long, and a slight difference in the sling swivels; bayonet model 1763.

Musket Model 1770. Length 4 ft. $10\frac{5}{8}$ in.; similar to model 1768 but has heavier barrel; exterior of pan rounded; stouter mountings; ramrod spring fixed to rear band; bayonet model 1763.

Musket Model 1771. Differs from model 1770 in reduced size of butt and in having the outline of the under part of the grip and butt convex instead

of concave, and in having face of lock plate and cock rounded; bayonet model 1763.

Musket Model 1773. Practically the same as model 1771. Weight 9 lbs. 6 oz.

Musket Model 1774. Differs from model 1773 in weighing 10 lbs; spring on barrel to hold bayonet; bayonet has long socket containing a long slot, a short parallel slot, and a slot connecting the shorter at its rear to the longer roll on rear end of socket.

Musket Model 1777. Length 4 ft. 11 $\frac{5}{6}$ in. barrel length $44\frac{3}{4}$ in.; caliber about $\frac{69}{100}$ of an inch; weight $9\frac{1}{2}$ lbs.; breech of barrel has 5 short flats; touch-hole instead of being horizontal slopes slightly upward from pan into chamber; stud screwed to muzzle band; outline of stock similar to that of models 1771–74: cheek indentation in left side of butt; rear tang of trigger guard has finger recesses; bow of trigger guard markedly elliptical; all screw heads flat; muzzle band held by a screw on forward part at right; middle band held to wood by a screw; butt plate and its tang make a right angle; lock plate wide for its length; brass pan horizontal, no fence; frizzen has its face in two planes, the upper tipping slightly forward. Bayonet model 1774.

Dragoon Musket Model 1777. Length 4 ft. $9\frac{1}{2}$ in.; barrel length $42\frac{1}{6}$ in.; mounted with brass, with the exception of the middle band which is of iron;

middle band is two-strap: otherwise like infantry musket.

Artillery Musket Model 1777. Length 4 ft. $3\frac{1}{3}$ in.; barrel length $36\frac{1}{5}$ in.; middle band brass, sling swivels iron, otherwise like dragoon musket.

Marine Musket Model 1777. Length 4 ft. $9\frac{1}{2}$ in.; sling swivels brass; otherwise like artillery musket.

Musketoon (cavalry) Model 1777. Heavy-cavalry arm; length 3 ft. $10\frac{1}{7}$ in.; barrel $33\frac{1}{3}$ in.; cheek recess in butt; rear band of brass; rod and traveling ring on left side as with musketoon model 1766.

Committee of Safety Muskets. In the spring of 1775 the many committees of safety throughout the thirteen colonies were greatly concerned to provide guns for the inevitable war. As a general thing each committee detailed at least one member to attend to the manufacture or purchase of arms. These men engaged the gunsmiths — there were at least 200 in the Colonies, mostly south of New England — and many blacksmiths, to make arms under contract. Perhaps 50 per cent of all the gunsmiths in the Colonies were in the middle Colonies, but probably the first muskets made for use against England were made in Massachusetts, which was the Colony where the principle of "liberty or death" was first most aggressive. Following the act of Great Britain in 1774 prohibiting the exporting of firearms to the Col-

onies, Massachusetts appointed Richard Falley (also spelled Foley), of Westfield, Massachusetts, Thursday October 27, 1774, as master armorer. He was already locally celebrated as a gun maker. He established at once a factory of considerable output. The next Colonial factory was established by act of the Assembly of Virginia in June, 1775, at Rappahannock Forge near Fredericksburg, Virginia. This armory was destroyed by fire before 1780. Then came Pennsylvania, which established in February, 1776, a gunlock factory in Cherry Street under Peter de Haven, master. This "lock" factory quickly developed into a full-fledged armory, and the records of the time mention constantly the manufacture and repair of guns there. In the "Minutes" of Wednesday, August 20, 1777, it is called the "Factory of Muskets and Other Arms." It was then at French Creek in Chester County, and on October 3, 1777, the Council of Safety voted to move it to Hummels Town in Derry Township. It was abolished in 1778, and an order was issued December 17, 1778, to auction the tools and parts of incompleted firearms. Apparently there was no bidder, for January 10, 1779, Mr. Stiles, Commissary of Military Stores, was ordered to receive the following stores and give his receipt to Mr. de Haven: 139 sets complete and finished gun mount-

ings; stamps and brands; 113 gun locks; 237 gun barrels; 141 new muskets lacking only bayonets and ramrods; 25 new muskets lacking only ramrods; 18 new muskets complete; 300 gun stocks.

Beginning October 27, 1775, Mr. Robert Towers was directed to prove all the muskets made in Philadelphia for the Provincial Service and to stamp them P. In the "Minutes" there is constant mention of the purchase of brass for "mounting the Provincial muskets." Copper, of which to make brass, is mentioned July 19, 1776. The name "firelocks" occurs repeatedly for flintlocks. The muskets made at the "factory," and also by gunsmiths, were, after the 5th of December, 1775, supposed to be made in accordance with a pattern musket, but the rule was not enforced; anything that was serviceable was acceptable. According to the recommendations of the Provincial Council of Pennsylvania, July 3, 1775, muskets were to have barrels 3 ft. 8 in., bore 17 balls to the pound. July 18, 1775, gun makers were recommended to make "substantial muskets with barrels 3 ft. 6 in. long, to carry an ounce ball, and to have bayonet and steel ramrod." Valley Forge supplied muskets modeled after the Charleville 1777 pattern. Their lock plates were stamped "V. Forge" and the date of manufacture.

An occasional musket which is believed to have

been used in the early part of the war bears the capital letters C P on the lock plate. These letters — large, and usually engraved, of irregular form and often out of line, probably stand for Continental Property. So far as now known, they were placed only on such lock plates as already bore other identification marks. At the beginning of the war gunlock makers were scarce in America. Guns previously made in America generally were equipped with imported locks. There was on hand a small stock of these imported and foreign marked locks, others were immediately obtained abroad, and others yet were taken from a stock on hand of old and partially bad Dutch and French muskets. In order that the new gun with the foreign lock might not later be mistaken as the property of some state which had furnished its militia with a similar arm, the Continental Congress ordered the C P identification mark. There seems to have been one other use for the mark. That was upon complete arms purchased abroad — such arms would otherwise be undistinguishable from the quantities of similar ones already in America. It is probable that the C P was used only during 1774, 1775, and part of 1776, for on September 9, 1776, Congress resolved that the word "Colonies" and the words "United Colonies" should thereafter be replaced by "United States."

COMMITTEE OF SAFETY MUSKET MAKERS

Some did and some did not stamp their names on their productions.

VERMONT

Thomas Hill, of Carlotta.

MASSACHUSETTS

Richard Falley, of Westfield. He became ensign in Colonel Danielson's regiment, then was appointed armorer for Massachusetts, "said Falley being a complete master of the business. To have 40 shillings per month in addition to his pay as ensign." His rank later became lieutenant.

Hugh Orr, of Bridgewater. Born January 13, 1717, at Lochinwinioch, Scotland; came to America 1737; gunsmith and lock filer; inventive, bright, many interests, became prominent. In 1748 made 500 stand of muskets for Province of Massachusetts Bay; made many more during the Revolution. Died December, 1798. Son Robert in 1795 became master armorer at Springfield.

Thomas Earl, of Leicester, about six miles from Worcester. Famous; considered the equal of any workman in America at that period.

"Deacon" Barret, Concord. Had large and complete water power shop in 1774.

—— Beman.

—— Dike, of Bridgewater.

Martin Ely, of Springfield.
Gideon Frost.
Benjamin Guillam.
Seth Johnson, of Old Rutland.
Seth Pomeroy, of Northampton.
Enoch Putnam, of Granby.
Shubabel and Joseph Sever, of Framingham.
—— Shaw.
Asa and Andrus Waters, of Sutton.
Horace White, of Springfield.
Anos Whittemore, of Boston. Before and after 1800 made rifles.
John Wood, of Roxbury.
A factory in Northboro. Details missing.

RHODE ISLAND

Stephen Jenks, North Providence. (Doubtful if he made locks during the Revolution.)
Jeremiah Sheffield.
George Teff.

CONNECTICUT

Lieutenant Ard Welton, Waterbury. Made a few by hand alone.

NEW YORK

Waters, of Dutchess County.

MARYLAND

Richard Dallam.
Isaac Harris.
Henry Hollingsworth, Elkton. Particularly barrels and bayonets.
John Messersmith. Lock maker at $3.00 each in 1776, doubtful as to complete guns. Moved Lancaster in 1776; perhaps to Philadelphia also.
Robert Read, Chesterton.
Sterewith.

Wm. Whetcroft, Annapolis. Spring of 1776 making 50 muskets per week on contract.

Elisha Winters. Contract in 1776 for 600 muskets at £4 5*s*. each.

John Yost. Contract for muskets at £4 5*s*. each, rifles at £4 15*s*. each.

PENNSYLVANIA

William Antis, of Frederick Township.

John Baker, of Providence Township.

Marmaduke Blackwood, of Philadephia. Two hundred locks at 22*s*. 6 *d*. each, according to pattern.

John Butler, of Lancaster.

James Chapman, of Bucks County.

Ebenezer Cowell.

Robert Craig, of Philadelphia, gun-locks.

Peter de Haven, of Philadelphia. Celebrated. Superintendent of Provincial Factory.

Hugh de Haven, of Philadelphia.

Michael DeReiner, of Lancaster.

Adam Deterer, of Lancaster.

—— Dunwicke, of Chester County. Had made 86 muskets up to January 3, 1776.

John Eberly, of Lancaster.

Joel Ferree, of Lancaster. Thirty or 40 guns weekly.

Ludwig Fohrer.

Joseph Foster.

Henry Gingerich, of Lancaster.

—— Gouger. Commissioned to make 35 muskets.

Caspar Halburn, of Lancaster.

William Henry, of Lancaster. See under Rifle Makers.

—— Jost, of White Plains Township.

Peter Kascheline, of Northampton County.

Matthias Keely. Contracted to make 100 muskets.

Sebastian Keely.

John Kerlin. Contracted to make 50 muskets at £4 5*s.* according to pattern.

—— Kinder. Contracted to make 35 muskets.

Henry Myer, of Lancaster.

James McCormick.

Abraham Moore, of Coventry Township, Chester County.

Christian Oberholzer, of Lancaster.

James Pearson.

Lewis Prahl, of Philadelphia County.

John Pringle. Gun lock maker.

George Radfang, of Lancaster.

Benjamin Rittenhouse, of Norrington. Superintendent of a gunlock factory — probably a co-worker with Peter de Haven. Contract for 200 muskets at £4 5*s.* each.

Benjamin Town. Contract for 200 muskets at £4 5*s.* each.

—— Tomlinson.

——Valley Forge — an armory established in 1742 by Stephen Evans, Daniel Walker, and Joseph Williams; at first called Mount Joy Forge; about 20 miles from Philadelphia; in operation for a century.

John Vondegrift, of Bucks County.

T. Wickham, of Philadelphia. Muskets.

Samuel Wigfal, of Philadelphia. Two hundred gun-locks according to pattern. at 22 *s.* 6 *d.* each.

—— Wiley.

John Willis. Two hundred muskets at £4 5*s.* each, according to pattern.

Josiah Wood, of Norrington Township.

VIRGINIA

The Rappahannock Forge, near Fredericksburg, established by act of the Assembly in June 1775.

The Spitzers, father and son. Rifle makers; probably made muskets also.

NORTH CAROLINA

At Charlottesville a rifle factory was established in 1740 by workmen who had been with the Lemans of Lancaster, and this factory probably made muskets; it is known to have made pistols.

In Pennsylvania the average price of a Committee of Safety Musket was about equal to $30 of modern money. As Continental Currency decreased in value to 3 cents on the dollar — or even to no value at all — the price in gold or silver soared high.

Collectors of American military arms value Committee of Safety weapons because they were the first U. S. Government arms.

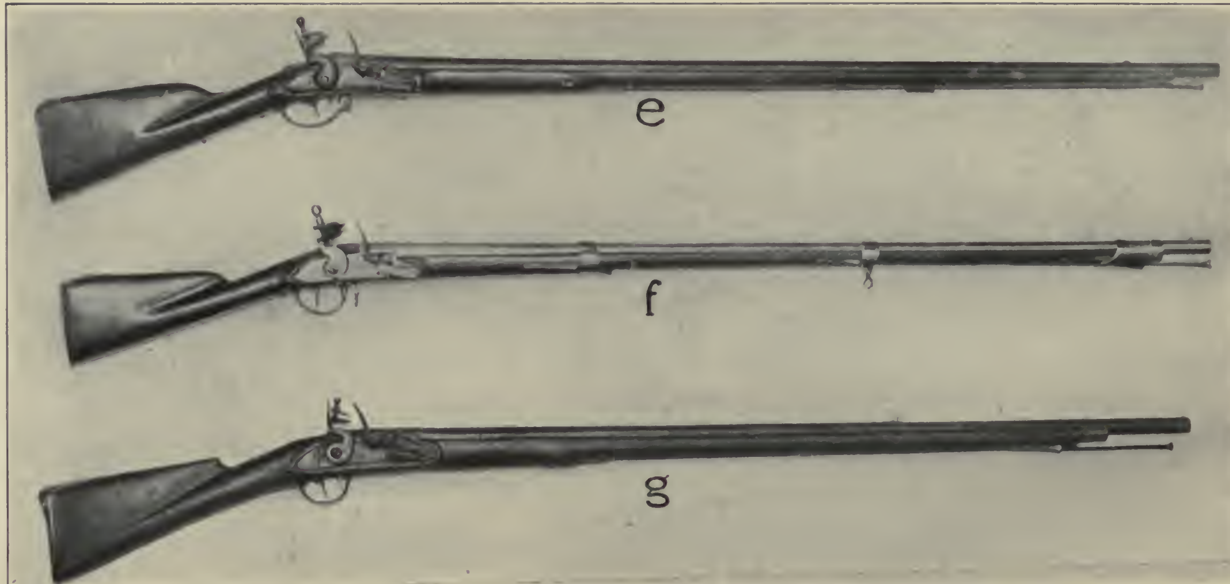


PLATE No. 11. — *e*. Grenadier Musket of the Hessians. *f*. Musket of the French (Charleville mod. 1763)
g. Committee of Safety Musket

THE COMMITTEE OF SAFETY MUSKET SHOWN

Plate No. 11, *g*

Weight 10 lbs. Length about 5 ft. Barrel length 3 ft. $8\frac{1}{2}$ in. Caliber about $\frac{3}{4}$ of an inch. Wood red birch. Mountings brass containing considerable copper. Marks on lock — E. Ong. Ong was a workman in the Philadelphia factory under Peter de Haven. Judging by the composition of the brass the musket was made during July or August of 1776.

MISCELLANEOUS SMOOTHBORES

The Committees of Safety of the various Colonies not only had arms made, but they also appointed members to go about the country collecting from the people all serviceable arms that they could spare.

The result of distributing to the soldiers this medley of guns was to make, in the matter of ammunition, "confusion worse confounded." The Pennsylvania Committee of Safety therefore directed that the guns of its soldiers should be calipered. The report (May, 1777) states that guns of the following gages were in use: — 13, 15, 17, 19, 21, 24, 30. Gage meant number of spherical balls to the pound. The diameter of the bore of a 13-gage gun would be about seventy-three one hundredths of an inch, while that of a 30-gage gun would be about fifty-four one-hundredths of an inch, so that the bullet of one would be useless for the other.

The report does not state whether these were military arms or just guns, but as other records of the time mention that in the early part of the war each soldier was expected to furnish his gun (and accessories too), and as three quarters of an inch,

which was about 13 gage, was standard for all but French military arms, it is fair to assume that guns with gages smaller than 13 were mostly sporting arms.

These sporting arms were medium-grade ones. It is not reasonable to suppose that a poor soldier would sport an elegant and expensive weapon, nor that an officer or a wealthy soldier would enter the army carrying, for instance, an H. Nock double-barreled gun worth two hundred dollars or more in gold when he had the wherewith to buy a common one. Yet there were, of course, good sporting smoothbores in the war.

THE SPORTING SMOOTHBORE SHOWN

Plate No. 12

The two pieces chosen to illustrate this type of arm are intended to be typical. No. 12, *h*, is a perfectly plain fowling-piece which when new was within the means of the average farmer and working man. It is of English make, date somewhere between 1750 and 1775, and bears the private proof-mark of Wogdon, a London gun maker. Its length is 5 ft. 3 in., barrel length 4 ft., gage 20, weight 7¼ lbs. and it is stocked with plain black walnut. Sporting arms were made with long barrel at a very early date. European collections show them seven feet or more long, wheellock, dating about 1600. They were common in America in Revolutionary times and before. The long barrel permitted the complete combustion of the poor or coarse-grained powder so common then, and also there was a common but mistaken belief that the longer the barrel the greater the accuracy. They were particularly liked by Indian traders, too, who charged for a gun a pile of skins of equal height.

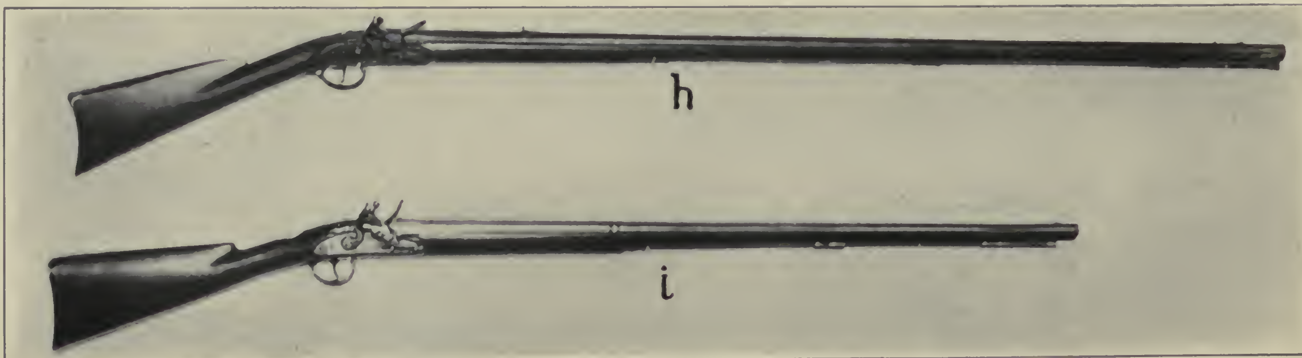


PLATE No. 12. — *h*. Long Sporting Smoothbore. *i*. Brass-Barreled Sporting Smoothbore

The other piece, No. 12, *i*, goes to the other extreme, and is an expensive weapon, although not abnormally so. This gun has a brass barrel instead of an iron one in order that it might not spoil from rust when neglected. It is probably of American make with an English lock. Its length is 4 ft. 4½ in., barrel length about 3 ft., gage 32, weight 8¼ lbs., stock of a good grade of black walnut. Its mountings are neatly engraved, it has a raised oval silver name shield, and shows skilful workmanship. The lock is marked "R. Ashmore. Warranted." Arms of Ashmore's name bearing dates during the seventies indicate that Revolutionary War claims for this gun could be genuine. Never much used and in practically new condition.

ACCESSORIES

Plate No. 13

Cartridge. — Ammunition was generally furnished to the soldiers in the form of cartridges. A cartridge consisted of a charge of powder and a ball — sometimes a ball and buckshot — wrapped with paper into the form of a cylinder, the ends of the cylinder being fastened by twisting or by paste. For a musket of three quarters of an inch bore the British standard of four and a half drams of powder with a four hundred and ninety grain ball was usually followed. The ball was somewhat smaller than the bore of the musket in order that it might go easily into a barrel fouled by firing.

Cartridge Box. — Cartridge boxes were much alike regardless of nationality, with one exception: a few of the American soldiers were provided by Congress with tin cartridge boxes. Otherwise the one shown is typical. It is claimed to have been carried by Laban Lewis, of Milton, Massachusetts. It may have belonged to a British soldier before it was issued to him. The interior part is of wood, bored

with twenty-five cylindrical holes to keep the cartridges separate and prevent damage by rubbing together. The exterior is covered with leather, now very hard, stiff, and brittle from age.

Brush and Picker. — A musket accessory of questionable serviceability consisted of a brush and picker attached together by a chain and usually worn hanging from the shoulder strap but sometimes carried in the knapsack. In a regular army they were a part of the regulation equipment. The picker was for the touch-hole. The brush was for cleaning the flint, frizzen, and pan.

Éprouvette. — The éprouvette, or powder tester, was a necessity due to the unequal strength of different brands of powder and to the inequality of different outputs of the same brand. A small charge of one issue might be equal to a large charge furnished later and a large charge of strong powder might cause serious consequences. A sample tested in the éprouvette gave the clew as to what amount to use to get equal shooting. Éprouvettes were of many different designs, but all depended upon the same principle. A measured amount of powder, exploded in the éprouvette, did work against the tension of a spring, or against friction; the work done was indicated or measured on a dial or numbered scale, showing the strength of the powder.

Powder Horn. — Many soldiers — particularly in the American army — carried powder horn and bullet pouch instead of cartridge box; some carried two horns, a large one for powder for the charge and a small one for fine-grained powder for the flash pan. These horns were slung by cords from the shoulders. Some of the soldiers who had artistic tendencies carved their horns — or, rather, engraved them — with crude but interestingly drawn objects, scenes, plans of the country where they were stationed, views of fortifications, etc., and added the date, their name, company, regiment, etc. Many of those Revolutionary-pictured horns are still in existence. Those that bear critical inspection, and those that conform with their descriptions in old wills and other documents are very interesting. But large new horns engraved by professionals were for sale in the stores less than a century ago. They were regular articles of commerce, not imitations. Also there are many recent imitations. The large horn shown measures 17½ inches along the outer curve.

Bullet Mold. — The bullet mold shown in the center of picture No. 13 is the regulation Brown Bess mold. It is of iron. The molds for sporting arms were similar when made to cast a single ball. Close to the mold, between the handles, is a sharpened

portion acting like a pair of scissors, to cut off the sprew or neck of the bullet. The Committees of Safety had large brass and iron molds made which would cast, at one time, many bullets varying in size from small ones for sporting arms to those three quarters of an inch in diameter. Soldiers who used loose ammunition cast their own bullets when sitting about their evening camp-fire.

Bayonets. — The Brown Bess bayonet measured 21¾ inches in length including the socket. That of the French musket model 1763 measured 17½ inches including the socket. They are shown flanking picture No. 13, the Charleville being marked *d*, the other *g*. The Americans used bayonets copied from these two kinds, and those of all sorts of designs made by country blacksmiths — that is, when they had bayonets. Probably not one half the American army had bayonets. The German bayonet is unknown. The Ferguson rifle was equipped with a bayonet 25 inches in length, 1½ inches wide, flat and lithe. A bayonet was carried in a scabbard attached to a belt hung from the shoulder; the cartridge box being carried the same way on the opposite side of the body, the belts therefore crossed at about the center of the breast. The crossing was secured and marked by a buckle; hence the famous American order, "Aim for their buckles."

Flints. — The best gun flints were made in England. Those of light color were preferred. They were shaped by a flaking process called knapping. A good flint could be used about sixty times. A new flint was usually set in the cock with the flat side up. Soldiers sharpened them when worn blunt by chipping off flakes from the edge backwards. Soldiers were not allowed to snap their locks in play or practice except when the flint was replaced with a wooden dummy called a snapper.

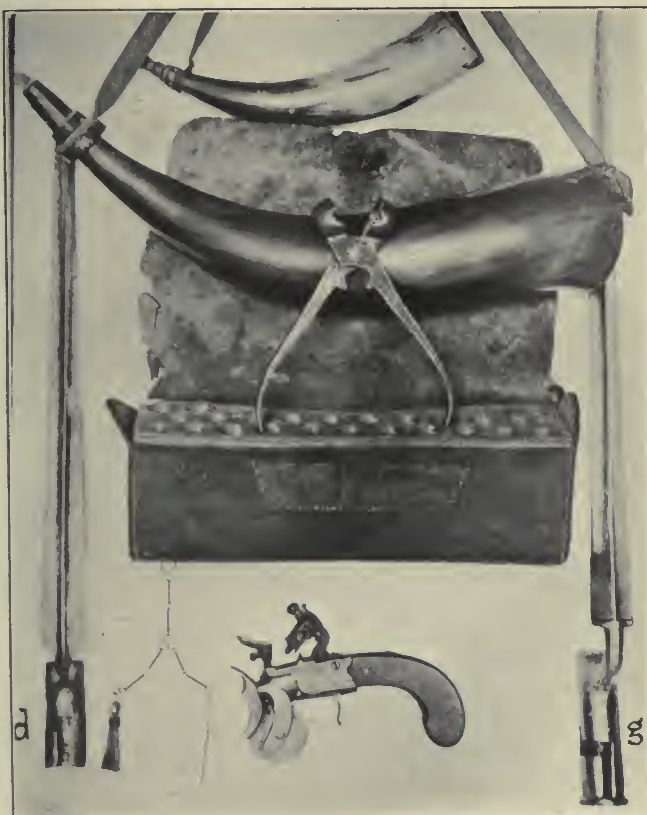


Plate No. 13. — Accessories

RIFLES OF THE BRITISH — THE FERGUSON

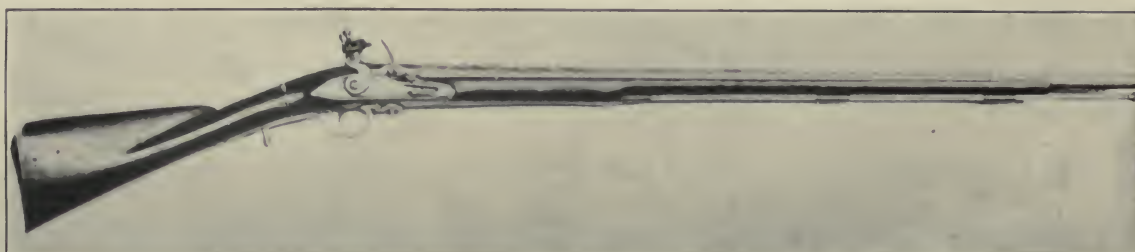
PLATE NO. 14

There were only two places in the world where rifles were considerably in use before the nineteenth century — Central Europe and the central Colonies in America. The whole British army contained only two expert British riflemen — Captain George Hanger (subsequently fourth Baron Coleraine) who commanded a Hessian Jäger company, and Major Patrick Ferguson of the 2d Battalion, 71st Regiment Light Infantry, Highlanders. The British attempt to remedy the deficiency consisted in hiring European riflemen and in endeavoring to equip some of their own troops with breech-loading rifles patented by Major Ferguson. As this breech-loading flintlock rifle was the first military breech loader adopted into any service; as it was a serviceable and practical weapon patented in England in 1776 where rifles were almost unknown; as it was used against the Americans in several battles and many skirmishes; and as Ferguson lost his life and

the important battle of King's Mountain on the 7th of October, 1780, for lack of his own rifles, it is a particularly interesting weapon.

Apparently only about two hundred of these rifles were made, and their military use ended with the war. Their makers were S. Turner and D. Egg, of London, and Newton, of Grantham, who made the one illustrated. Possibly other gun makers produced a few. Except for uniformity in the device for loading, these rifles by different makers are otherwise unlike. Some of them, perhaps all, were fitted with bayonets. (See Accessories.) This one by Newton is shaped like a small Brown Bess, is 4 ft. 5 in. long, the barrel is 36 and $\frac{5}{8}$ in. long, and the caliber is about $\frac{11}{16}$ of an inch. In order to load it the trigger guard is used as a lever to lower, by a single sideways revolution, an upright screw-bolt which passes through the barrel from bottom to top. When the bolt is lowered there is a hole in the top of the breech of the barrel. The bullet is dropped into this hole to the chamber; the barrel, tipped muzzle downward, lets the bullet run forward to the front of the chamber where it sticks in the space constricted by the lands; a charge of powder is then poured into the hole and fills the space behind the bullet. One turn of the trigger guard causes the bolt to rise and fill

Plate No. 14. — Breech Mechanism of Ferguson Rifle



Ferguson Rifle

the hole, leaving the rifle loaded and the action closed.

The service bullet for this arm was spherical, but Ferguson himself used by preference a pointed bullet of his own design. With this rifle four aimed shots per minute could be fired, as against an average of one shot in fifteen minutes with a European muzzle-loading rifle after it had become foul. The fouling of the Ferguson did not delay the loading. With a muzzle-loading rifle, if the charge became wet by rain or immersion, the rifle was useless from that moment until such time in the future as it could be put into a vice and the breech-pin taken out with a special wrench. The Ferguson, however, could be made serviceable again within five minutes. It is surprising that rulers of the period failed to appreciate its merits.

Although in rapidity of fire this English rifle was superior to all others then in use, it stood second to the rifles of the American backwoodsmen in precision. In that, they led the world. Its inferior accuracy was due to the thinness of the barrel in combination with the heavy ball and large charge of powder, and to the fact that it was bored and rifled by gunsmiths who knew nothing of rifle making.

RIFLES OF THE GERMANS

About six hundred of the German soldiers who were sent to America were riflemen — called then "Jägers," and "Chasseurs." Most of those men were, at home, foresters or gamekeepers, and the rifles they brought were mostly their personal property. They were plain but serviceable. Some of the Jäger officers had elegant weapons inlaid with gold. But, plain or decorated, all the German rifles had a general resemblance; they were short, heavy, of large bore, with ramrods of iron or steel. They were without bayonets. The form of the stock was liable to be like that shown in the picture; the upper and lower edges when seen sideways showed as straight lines; seen endways the comb was rounded and the bottom of the stock between the toe and the grip was often flat and about three quarters of an inch wide. Plain rifles were usually mounted with brass; elegant ones were commonly mounted in steel or iron beautifully chiseled, embossed, and engraved; some were silver mounted. The average barrel length was 30 to 32 inches; barrels were almost always octagonal; the usual twist of the

rifling was one turn in about five feet; the caliber was about three quarters of an inch, sometimes more, rarely less.

These German rifles were identical in every way with the rifles in use in Central Europe about 1700, which served as models from which the immigrant Pennsylvania gunsmiths developed the American rifle. The greater part of them were probably made in Germany, and such were often unsupplied with a rear sight; in the Black Forest and in the heavily wooded parks of the German nobles where the Jägers served when at home the rifle was used like a shotgun — quickly and without conscious aim. The rifle shown in the illustration was made without a rear sight. Such of the German rifles as were made in Switzerland, where shooting was in the open, had elaborate rear sights, adjustable both vertically and horizontally, usually set in the wood back of the breech. These sights were such as had long before been invented for wheellock arms. The patch box (used in Europe not for patches but for flints) almost invariably had a wooden lid, which opened by sliding rearward. This, also, was a survival of wheellock days. It was not so practical as the hinged metal one of American design, because it came entirely off and could be lost; it was also not so decorative.

Some of the causes of the inferiority of the European rifles, in comparison with the American rifles, were as follows: the European gun makers were not so skilful as the American in giving just that pitch to the grooving which adapted the spin of the ball to its mass; the ball was badly deformed by the pounding necessary to seat it, and offered uneven resistance to the air while in flight, while the ball of the American rifle issued from the barrel uninjured; the recoil of the European rifle was so severe as to cause flinching, and the balance such that if the shooter had the slightest attack of "nerves" the aim was much disturbed, while the recoil of the American rifle was light and the balance so far forward that the barrel swung slowly; the sights on a European rifle were near together in comparison with those on a "Kaintuck," hence the alignment of a European arm was less accurate.

THE GERMAN RIFLE SHOWN

PLATE No. 15, *l*

Total length 43 in., barrel length $27\frac{1}{2}$ in., weight about 10 lbs., caliber about $\frac{11}{16}$ of an inch or 15 balls to the pound. The bore is hexagonal, with grooves at the corners, and slightly opened at the muzzle to facilitate loading. The sliding lid of the patch box is held shut by a spring catch. There is a cheek piece of immature design — merely an excrescence. The maker's name is too nearly obliterated by many scourings to be legible.

RIFLES OF THE AMERICANS

The typical American flintlock rifle, later called "Kentucky," or, in the dialect, "Kaintuck," had reached its full development by 1760. In the hands of such pioneers as Morgan, Boone, John Rogers Clark, John Sevier, James Harrod, and others of their kind, the best of the American rifles were then about as accurate at short range as the genius of five generations has been able to produce since. There were poor "Kentucky" rifles as well as good ones, and there were then, as now, several indifferent marksmen to every good one. To be an expert rifleman a man needed a strong body, perfect nerves, excellent eyesight, sound judgment, and lots of practice. In addition he needed a capacity for infinite painstaking, that he might load understandingly, carefully, and methodically, and give regular, frequent, and strict attention to the cleanliness of his weapon. In such hands a rifle classed as an instrument of precision. We must not, however, believe one of those rifles capable of all the marvelous feats attributed to it by the story tellers, nor believe it to have been accurate at long

range; many an enduring reputation was built on a chance shot.

It is not possible to determine the exact capabilities of these old-time rifles by tests, because there is not one of them in existence with its bore and grooving as good as new. But, knowing modern rifles, the wonderful delicacy of the machines that make them, the degree of perfection of the weapon itself, and its accuracy and regularity of performance, we can by comparing modern methods with methods of the time of the Revolution use our judgment as to the shooting capabilities of those old-timers.

In the large gunsmith shops of the cities it is probable that many minds were given to the making of a gun; that one man forged, one made locks, one filed mountings, one made stocks, one assembled, one did inlaying, carving, engraving, and fitting; probably the boss himself rifled the barrel, put the finishing touches to the complete gun, tested it at target, and delivered it to the customer with lengthy encomiums. But in the smaller shops which formed the great majority — mere cabins on the outskirts of the wilderness — one man with or without an apprentice did every part of the work. There is not a place in the world, unless perhaps in Bohemia, where the feat is done to-day; machinery and specialization have made it unprofitable. Those lone, isolated

workers were men of wonderful resource; poor, and without machinery, they not only made guns but also the tools with which to do their work. They were ignorant of science, and they cared nothing for cause, but they were skilful in effect. They could not calculate in advance the chamber pressure in foot-tons, the velocity of the bullet, bearing surface, friction, trajectory, flip, drift, penetration, and work in accord with the calculations; they did not bore their barrels correct to the five-thousandth part of an inch; they could not cut all the grooves of exactly the same width and depth; but after the gun was done they adjusted the bullet, the powder, and the sights until the rifle would shoot into the bull's-eye at a measured distance — perhaps a two-inch bull's-eye at eight rods would do for the average, some would better it.

The shop of the isolated gunsmith was a log cabin, perhaps twelve feet wide inside, twenty feet long, seven feet to the eaves, pitch roof. In one end was the door; at the far end was the chimney. The wide-open door let in at least one half the light, the remainder came in at a window in the side near the front, over the long work bench. From the brown rafters dangled bunches of gun parts, steel traps, and accumulated odds and ends. In the corners and along the unwindowed wall stood bunches of

guns to be repaired and cheap guns to sell. Fine guns lay on wooden pegs driven high up, out of harm's way. In the dim rear of the shop stood the forge; between it and the rear wall lay the great leather-covered, clanking, and wheezing bellows. Front of the forge was the anvil. The bench continued way down into this dim rear of the shop; it was littered with clutter and tools; large tools leaned against it and the forge.

The smith, clad in grimy deerskin, great cowhide apron worn and black, sleeves rolled up, shaggy beard hanging down his hairy breast and in his way, puttered about getting ready to make a rifle. The customer had notions about his gun, and "wanted her to have a 4-foot bar'l to rurn 'raound onct in half a rod." The smith, having no tools to fit this particular case, had to make them. First he set the barrel-to-be — a forging already rough bored in spare time — horizontally in a vise at the side of the long bench. Next he fastened, close in front of it, a device containing a solid iron wheel with a small square hole through its axis and its circumference divided by notches into 3, 5, and 7, equal parts.

The wheel could be turned $\frac{1}{3}$, $\frac{1}{5}$, $\frac{1}{7}$, or the whole way around, and fastened by a catch fitting the notches. Then he poked around in the dimness, overhauling his stock of iron until he found a rod

about 10 feet long, ¼ inch square, and fairly straight. Then, on the dirt floor, he laid a long, wide, and deep line of charcoal from the forge, and when it was all glowing put in the rod to heat to redness. While it was heating he laid off on the edge of his bench 8¼ feet from the iron wheel in the direction away from the waiting barrel, and fastened a wrench containing a quarter-inch slot. Between these two extremes the red-hot rod was to be fastened, and, in order that it might not sag he fixed several supports. The rod, hot and glowing, was then poked at one end into the wheel and also fastened into the wrench. One complete turn of the wheel and the rod was twisted so that in a length of 8¼ feet (half a rod) its spiraling edges went once completely around it. One of the tips was cut off and a rifling cutter secured to the rod there. The rod, now cool, was slid through the square hole in the center of the wheel, down the gun barrel to the breech, the cutter raised, the rod drawn forward, and there on the inside of the barrel was a groove which made a complete revolution in the required distance. Successive slidings caused the required depth of cutting. Five or seven turns of the wheel caused five or seven grooves in the barrel. Odd numbers were preferred in order that a groove and a land might be on opposite sides of a diameter — mere witchcraft, so to

speak. When the cutting was complete a wad of tow was put on a ramrod and pushed from the breech along to within about two inches of the other end. The barrel, with this end up, was stood upright, an iron ramrod held so that its end went part way down that two inches, and melted lead poured in around it. The lead plug was thereby made fast to the ramrod, and also its exterior took the form and size of the interior of the barrel, with its lands and grooves. The plug was drawn out, the inside of the barrel oiled and dusted with fine emery, the plug inserted and worked back and forth until the inside of the barrel was clear of burrs and was sufficiently polished.

Other operations necessary to complete the barrel were shrewdly performed until the breech was ready to be threaded for the breech-pin (screw). No amount of poking and searching among the litter on the bench and in boxes and drawers was productive of a breech-pin of the right size. It was necessary to make one. So he whittled a pine plug, screwed it into the breech, withdrew it, and compared it with what dies he had of about that size. But unfortunately there was no mate for it; he recollected then that the barrel-blank was not of his own make but one he had purchased long ago. So the screw on the breech-pin must be made by hand. That

did not puzzle the old man; he was concerned only at the extra time and work for which there would be no payment. When he had forged a new breech-pin in the rough he set it in his simple home-made lathe and turned that part of it which was to be a screw into a cylinder. The diameter of the cylinder he made equal to the diameter, threads included, of the wooden plug. The wooden plug also showed the pitch of the threads inside the barrel, their depth, and distance apart on centers; these he reproduced upon the breech-pin by winding it with wire. Then he scratched the position of the wire with a sharp tool upon the breech-pin, removed the wire, and cut the threads by patient and skilful work with a triangular file. The barrel done, all but the browning, he selected a lock from a box of new ones; he could make a lock, a good one, and did when he had to, but it was cheaper to buy them in the cities, where they were imported from Europe. Next he picked out a good piece of wood for the stock from among the many pieces of curly maple and crotch cherry which had long been seasoning up among the rafters above the forge. He had cut these pieces himself in the forest. Days and weeks went by while he worked happily at his bench in the light of the open door and window, fashioning the rough wood with saw, plane, draw shave, and rasp into the long grace-

ful curves of a pioneer's rifle; letting in the barrel with rabbet planes and floats he had made himself; fitting the lock with marker, chisel, gouge, and borer. Last of all he took one of his scanty stock of silver coins and beat it thin, then with scissors cut out name-plate, escutcheons, and forms of moons and stars — lucky stars, he hoped. There remained only the browning, staining, polishing, and targeting. When, on the date appointed, the customer came, the gun was done. "Thar, Bill, she's yourn for a hundred an' sixty, gold or beaver, I don't care which. I ain't takin' none er ther dum Continental paper from no man. Y'u'll find her a keen critter ter shoot, an' with sech a man as y'u be behind her I'm glad I ain't relation to none er them British officers."

Of such a kind as this are the two typical rifles shown on Plate 15, one, *k*, is half stock, the other, *j*, full stock. They were probably made before the war began, or at the beginning, on account of having carving, checkering, silver inlaying, engraving, etc. It is probable that the 1000 rifles ordered February 24, 1776, by the Provincial Congress were plain ones, as were others made during the war, for men were too busy and money too scarce for useless luxuries. The records about those 1000 rifles merely state that the cost apiece was not to exceed £30, that they

were to have bridle locks, barrels not to exceed a length of 3 ft. 8 in., total weight not to exceed $7\frac{1}{2}$ lbs. each, balls to be $\frac{1}{2}$ ounce. They did not have bayonets. It is interesting to know that the telescopic sight is not new, and that the Minutes of the Provincial Council of Pennsylvania for September 7, 1775 state "Resolved, that there be procured a rifle that will carry a half-ounce ball, with telescope sight." Another variety of rifle, a few of which were used, was the double-barrel, both the side-by-side kind and the over-and-under. Of the latter there were, again, two kinds: one having fixed barrels and two locks, the other having only one lock for both barrels, which revolved.

These rifles shot spherical balls; many years passed before the elongated bullet called "picket" came into use. When dropped out of the mold the ball had a sprew, or neck, which was cut off with the scissors-like part of the mold, and the scar smoothed with a knife. Careful riflemen when loading kept this part of the bullet to the front. The bullet was a trifle smaller than the bore of the barrel, to allow for the thickness of its cover. This cover — called patch — was a bit of greased linen or buckskin, not fastened to the ball, but merely enveloped it, with its puckered opening to the front; it dropped off the bullet when leaving the barrel.

The greased patch greatly facilitated loading, and also made a gas-tight fit of the missile to the bore. A careful rifleman cleaned this weapon after each shot with a swab of tow. Hence shooting was rather slow. But if the atmosphere was dry and he failed to clean it each time, fouling from powder residue soon prevented loading at all. All sights were simple, and rigidly fixed; therefore long-range shooting was guesswork.

LIST OF AMERICAN RIFLE MAKERS PREVIOUS TO 1783

PENNSYLVANIA

Those marked * were early Lancaster rifle makers; if not living in 1775, some of their arms were nevertheless in use.

* Albright, Henry, Lancaster County, before and after 1744.

Backhouse, Richard, Easton. Barrel maker, lock tester, etc. Employee of Durham Iron Works.

Bauer, George, Lancaster.

Berlin, Abraham Easton.

Berlin, Isaac.

* Busch, Lancaster.

Cowell, Ebenezer, Allentown.

Cowell, P.

* Decherd (Dechert, Deckard, Descherd, Dickert), Jacob. Probably various spellings of same name. Famous. Philadelphia before and after 1732, Lancaster before and after 1753. One rifle by him now in existence has 48-inch barrel, 64 inches over all, half-ounce ball, 12 lbs.

Deringer, Henry. Son of this Deringer made the famous percussion pistols.

* Drippard, Lancaster.

Farnot, Frank, Lancaster.

Farnot, Jacob.

Ferree, Jacob, and son Joel, Lancaster. In 1785 moved shop 24 miles up the Monongahela from Pittsburg.

* Ferre, Joel, not Jacob's son, Leacock Township near Lancaster before and after 1750.

* Follecht, Lancaster.

Fondegrift.

Fondesmith, Lancaster.

Foulke, Adam, Easton, Allentown, Philadelphia.

* Franck, Lancaster.

* Gaspard, Lancaster.

Gonter, Peter, Lancaster.

Golcher or Goulcher, John, Easton. Famous. Employed at Philadelphia "factory" to instruct in boring and grinding barrels. Returned to Easton. Made many fancy guns, especially single-lock revolving double-barrel rifles.

* Graeff, Wm. Reading, before and after 1761.

* Gresheim, Lancaster.

* Hench, Lancaster.

Henry, Wm., Lancaster, Philadelphia, Nazareth. Born 1729. Apprenticed to Peter Roeser at 16. Began for himself in 1750. Armorer to Braddock's expedition. Most celebrated gun maker of his time. At Lancaster had 14 employees. Son William became government contractor 1808, Nazareth.

Horn, Stephen, Easton.

Isch, Christian, Lancaster.

Jones, Charles, Lancaster.

Jones, Robert, Lancaster.

Kleist, Daniel, Bethlehem Township.

Laydendecker, George, Allentown.

* Leman, H. F. Lancaster, before and after 1740.
* Leman, Peter, Lancaster, before and after 1740.
* Lennard, Lancaster.
* Loder, Lancaster.
* Mayesch, Lancaster.
Messersmith, John, Lancaster, also of Maryland in 1775.
* Meylan, Martin, Lancaster, began 1719.
Miles, Thomas.
Miller, John, Lancaster.
Miller, Mathias, Easton.
Moll, John, Allentown.
Newhardt, Jacob, Allentown.
Newhardt, Peter, Allentown and Whitehall.
* Palm, Jacob, Lancaster. Moved to Esopus, New York in 1768.
Reed, Joseph, Lancaster.
* Riddel, Lancaster.
* Roeser, Matthew, Lancaster County, before and after 1744.
* Roeser, Peter, Lancaster.
Rugart, Peter, Lancaster.
Schorer, Andrew, Bethlehem Township.
Schreidt, John, Reading, before and after 1758.
Smith, Anthony, Bethlehem Township.
Smith, Johnston.
* Sneider, Lancaster.
Starr, Lancaster.
* Stenzel, Lancaster.
Taylor, George, Easton. Barrel maker, lock tester, etc. Employee of Durham Iron Works.
Tyler, John. When the "factory" was moved to Allentown he had charge; 16 men.
* Volvert, Lancaster.
Vondersmith.
Withers, Michael, Lancaster.
Wolfheimer, Philip, Lancaster.

* Youmans, Lancaster.

Young, Henry, Easton. Did large business.

Young, John. Easton. Skilled also as engraver and decorator. In February, 1776, had, with Johnston Smith, contract for 1000 rifles. In April, 1776, had, with Adam Foulke, contract for 130 rifles.

Young, P.

Virginia

Spitzer, father and son, Newmarket.

Kentucky

Mills, Harrodsburg, 1790, before and after.

North Carolina

A shop was established in 1740 at Charlottesville by workmen who had learned of the Leamans. Charlottesville rifles were esteemed. Their average price equalled about one hundred dollars of modern money. George Washington had at Germantown during the Revolution a pair of rifled pistols made at Charlottesville. They had 12-inch barrels and used half-ounce balls.

Miscellaneous

Before 1760 Lancaster had practically a monopoly at rifle making. Afterwards men who had learned there branched out for themselves. In 1768 Sir Wm. Johnson induced several Lancaster gunsmiths to migrate to New York, — to Schenectady, Esopus, Onondaga, Johnstown, and Canajoharie. By 1775 there were rifle shops in Baltimore, Cumberland, Alexandria, Winchester, Richmond, Camden, Salisbury and Augusta.

Of the following men the dates and locations are unknown; they may belong, they may not.

Bartlett.

Best.

Bosworth.

Hawkins. Probably went to St. Louis about 1800 and made the celebrated "Hawkins" rifles of the West.

Ludington.

Reynolds.

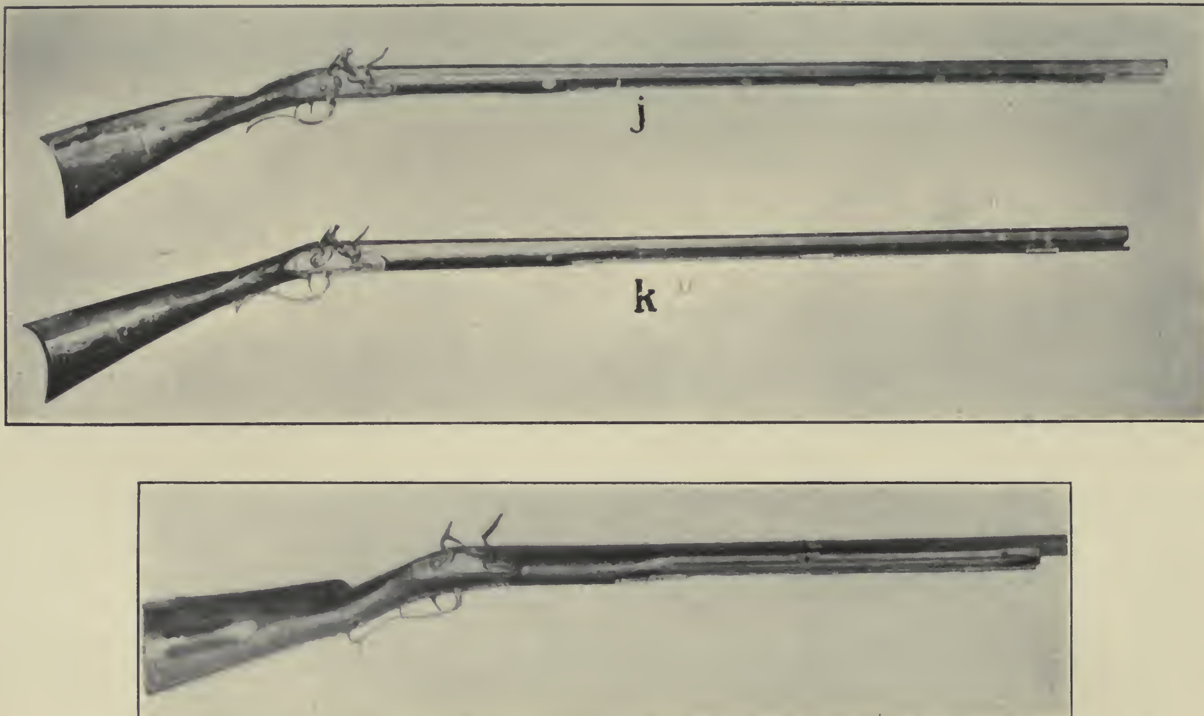
THE TWO AMERICAN RIFLES SHOWN

Plate No. 15

j. Full stock, curly maple, weight 11 lbs., length 4 ft. 11 in., barrel length 3 ft. 7½ in., full octagon. Fancy patch box marked "Reading" which opens by pressure upon a secret stud. Silver name-plate engraved B, eight silver escutcheons and a silver star. Pineapple and scroll carving. Cheek piece. Made at Reading, Penn., probably about 1770 to 1775.

k. Half stock, cherry, weight 9¼ lbs. Length 4 ft. 10 in. Barrel length 3 ft. 6 in., full octagon. Shoots ½ ounce spherical bullet. Deep grooving. Twist about one turn to three feet. Imported lock marked T. Ketland, who was a Birmingham maker from about 1750 to 1790. Patch box opens by pressure upon a stud in the heel. Fired many times at a target in summer of 1905, and shot well considering its age. Made in Pennsylvania, probably at Lancaster, about 1770.

Both of these rifles have plain triggers. The double set or hair trigger was in use, infrequently, in America, from the earliest times; after the Revolution it became so popular that almost all rifles were provided with it. It is believed to be a Munich invention, date 1543.



l

PLATE No. 15.—*j*. American Rifle, Full Stock. *k*. American Rifle, Half Stock
l. German Rifle

BLUNDERBUSSES

The derivation of the word blunderbuss is not clear. As probable an explanation as any is that it is a compound of the old German words *donner* and *büsche; donner* meant thunder and *büsche* meant gun barrel; the meaning of the compound word was distinctly appropriate. The funneling of the barrel was an evolution from the slight enlargement of the muzzle in matchlock days to facilitate the entrance of the bullet or a number of small bullets. There is a wheellock blunderbuss in the museum of Sigmaringen.

Although English and German troops of the seventeenth century were armed with blunderbusses for use in close quarters and in narrow passageways, no mention has been found of any troops so armed during the Revolution. On the sea, however, it was different. Probably every warship, whether English or French regular or American privateer, had on board a few or many blunderbusses for repelling boarders. That they were abundant in Europe in Revolutionary times is well known; they were not only used at sea but also were kept in almost every

household as protection against burglars, and were carried by every mailcoach and nobleman's carriage as protection against highwaymen. That they were fairly abundant in America is proved by the fact that when General Gage issued an order in April, 1775, that no citizens who left Boston should go armed, but must deposit all their weapons in Faneuil Hall, they left there by April 22, 1775, one thousand seven hundred and twenty-eight guns, six hundred and thirty-four pistols, two hundred and seventy-three bayonets, and *thirty-eight blunderbusses.*

The blunderbuss, absolutely useless as an arm of precision with either ball or shot, was unexcelled as a dealer of death in a neighboring multitude. Its bore is its peculiar characteristic. Each of the blunderbusses shown has its chamber the same diameter as that end of the ramrod which is in view. From the chamber the bore increases constantly and regularly until near the muzzle, when it widens suddenly like a funnel to many times the size of the chamber. This double funneling caused a great scattering of the charge, which was frequently made up of shot, slugs, bullets, nails, glass, pebbles, scrap iron and other junk, backed by a huge charge of powder.

Since a round muzzle causes shot to scatter in a circle, the round-muzzled blunderbuss wasted a

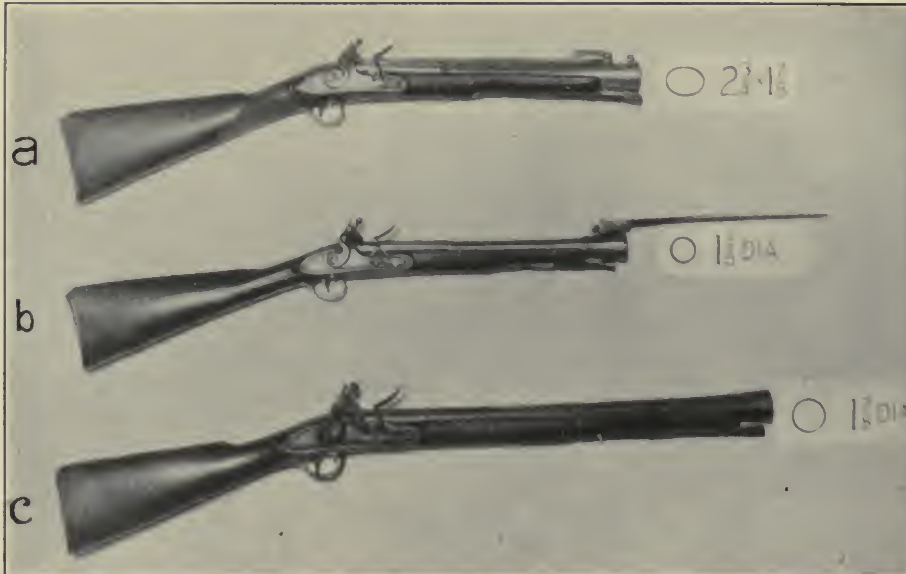
part of its charge over the heads and beneath the feet of its victims. To obviate that some genius hit upon the scheme of making the bore and muzzle elliptical, with the long axis horizontal so that the charge would act like a scythe.

THE BLUNDERBUSSES SHOWN

Plate No. 16

In picture No. 16 the one marked *a* has the bore elliptical. The muzzle measures $2\frac{3}{4}$ by $1\frac{7}{8}$ inches. The one marked *c* has an iron barrel with a $1\frac{7}{8}$ inch muzzle, and is believed to have had Revolutionary War service in the British Navy, but was probably seventy-five years old when the war began. The two with brass barrels (*a* and *b*) were probably made between 1760 and 1770, and each has a folding hinged bayonet on top of the barrel actuated by a powerful spring. In case the enemy escapes the discharge the blunderbuss man confidently awaits his rush and at the critical moment moves a stud which allows the very pointed bayonet to fly forward with incredible swiftness and spit the enemy to sudden death. The bayonet can also be used as a weapon of offense in the usual way, since when allowed to fly forward it automatically locks itself in position.

The highest type of single-barreled round-muzzled English blunderbuss is shown by *b*, which has a ringed barrel with one half octagonal and the other



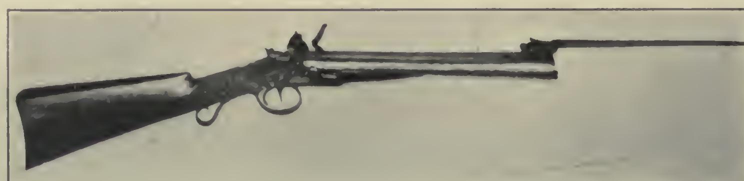


PLATE No. 16. — Blunderbusses

half round. It has "Fly or Die" engraved near the muzzle, and engraved brass mountings. The silver name-plate is engraved "I. Pritt & Co." The lock is case-hardened in colors. The wood is fancy walnut. The whole length is 29 inches, bayonet 11½ inches extra, weight 6½ pounds, muzzle diameter 1⅝ inches.

The elliptical muzzle one, *a*, which is stocked with mahogany, has a checkered grip. Either of these two, *a* or *b*, is about as fancy as an English blunderbuss was made, since a blunderbuss was distinctly not a sporting weapon. A European or American blunderbuss of pretentious ornamentation, without an indisputable pedigree, would be an object of suspicion to a collector; it would be classed with the "bazaar" antiques made at the present day so plentifully in the Orient to sell to the tourist who has more money than discrimination.

The fourth blunderbuss shown — not lettered — is a double-barreled one and is, on that account, unusual and especially interesting. The whole length is 30 inches, barrels 14 inches, bayonet when extended 11½ inches extra, caliber at the muzzle $\frac{15}{16}$ of an inch. The barrels are of stub twist, and have old London proof-marks. The mountings are simply but nicely engraved.

PISTOLS

Within reasonable limits the statement is true that pistols in Revolutionary War time were only useful in hand-to-hand encounters. Their inaccuracy at any but shortest range, and the inability of the user to keep one correctly pointed during the considerable interval between pressing the trigger and the exit of the bullet, were so generally recognized that sights on any but dueling pistols were considered unnecessary. An expensive pistol, or the pistol of a person skilled in the use of firearms, sometimes had a front sight of generous bulk, but its purpose was more to enable the eye readily to locate the position of the muzzle in quick aiming than to offer assistance in accurately aligning the barrel. Under such circumstances army pistols were really no more than pistol clubs, more effective, perhaps, as clubs; large, heavy, strongly built, and weighed and protected at the butt with metal.

Since revolvers were not in use then, and multi-barrel pistols that were good for anything besides maiming the user were so expensive that they were relegated to the wealthy, custom decreed that pistols

should be made and carried in pairs, so that if the first shot missed there was still one shot left as a last resort. Army pistols were carried usually in holsters, one slung each side of the saddle-bow. Both army and navy pistols frequently had belt hooks that were thrust inside the belt, or the sash, or the waistband of the trousers. Sporting pistols were made to be carried either way. Pocket pistols were made in a great variety of sizes, from the tiny one to go in the pocket of the large, loose, and ornamental vest, or medium-sized ones for larger pockets of the clothing, to formidable and rather weighty affairs to be carried in the big outer pockets of the great-coat.

There always has been and there always will be a fascination for masculine humans in the feel, the looks, the ownership of a pistol. And such men always want the best that money can buy. Therefore, while the unfortunate private soldier had to be content with the simple pistol his government furnished him, his officers and civilians of means created a demand for fancy hand firearms that put the gunsmiths to the keenest exercise of their ingenuity.

It is not surprising, therefore, that by the second half of the eighteenth century — and even before — all conceivable schemes in single and multi-barrel

pistols that could be adapted to the flintlock — the principle of the true revolver had long been understood and abandoned as impracticable with such means of firing as was then known—had been devised and most ingeniously utilized. Form, feel to the hand, and decoration reached a degree of excellence never since surpassed. Luxuries such as safeties, single-trigger action in double locks, single and double set-triggers, means for loading at the breech, and so forth, were as developed then as now, and as excellent. While these perfections did not increase the accurate shooting of the weapon, they made it fascinating and they made variety. How many kinds of pistols were used in the Revolutionary War no man knows nor ever will know, for many are lost and along with them all knowledge of them, but enough remains to give some idea as to how great the variety was. The scarcest of all Revolutionary-time pistols is the rifled pistol; military, sporting, and dueling pistols were smooth bored.

Since form, size, mechanism and the endless varieties of the devices for repetition of fire were repeated during the entire flintlock period, as a general rule it is safe to say that the only means of determining the date of manufacture of a flint pistol, and hence the possibility of use at any particular time, is by the marks on it. Hence the need of a

list of makers and their dates, proof-marks, etc. In some cities the coat-of-arms of the city was used during a certain period as a proof-mark. The coat-of-arms of Liège, Belgium, was used, for instance, up to 1810; of Vienna during the sixteenth century; of Nuremberg up to about 1750, etc. People who were entitled to a crest or coat-of-arms usually had it put upon the name-plate. These can be identified and information regarding them found by reference to Der Wappenbuch, by Stebmacher. One needs a collector's patience, however, as there are sixty large volumes and no index, and it is necessary to know the German spelling; for instance, a search for Liège would be without result, but a search for Lüttische would yield the desired knowledge. A good working knowledge of the history of ornament is very useful. English pistols mounted with silver are readily assigned to a date which is liable to be correct within a year by the hall-marks on the silver. These hall-marks are very minute — also very clear and perfect — and should be sought with the aid of a strong glass in the crevices of the ornamentation. They can be identified by comparison with the prints in Chaffer's Book of Hall-marks. Hall-marks of the cities of Continental Europe are given by various books which can be had in great public libraries, such as those of Boston, New York, and St. Louis.

REGULATION PISTOLS OF THE ENGLISH ARMY AND NAVY

The English mounted troops — dragoons and cavalry—used pistols as shown by *a* and *b*, picture No. 17. These two are similar except for the locks. That of *a*, the commoner type of the time, is a miniature of the Brown Bess locks of *a* and *b*, picture No. 10. The lock of pistol *b*, with a flat plate and flat cock, was a bit unusual in the period of the war, although designed long before — there is a specimen in a collection dated 1749 — and common after the year 1800. The ramrod of *b* is of wood; whether original or superseding an iron one is debatable. The ramrod of *a* is of iron, a miniature of that of the Brown Bess. Both pistols are brass mounted. Pistol *c* is the correct navy pattern — longer, and with belt hook. The swivel ramrod in Revolutionary times was uncommon. It is very probable that army pistols were furnished to the navy, and that sizes and calibers other than regulation were used in time of shortage; indiscriminate use of odd sizes, shapes, and calibers of all kinds of firearms was common in olden times. The belt hook, ramrod, and swivel of *c* are of iron; the other mountings are of brass.

THE ENGLISH REGULATION PISTOLS SHOWN

Plate No. 17

a. Length 15 inches, caliber $\frac{11}{16}$ of an inch. Marks on lock — Grice 1769, crown, G R, broad arrow.

b. Length 15 inches, caliber $\frac{11}{16}$ of an inch. Marks on lock — Tower, crown, G R, broad arrow.

c. Length $18\frac{5}{8}$ inches, caliber $\frac{11}{16}$ of an inch. Marks on lock — Bumford.

REGULATION PISTOLS OF THE GERMANS

Although about 30,000 Germans were hired by King George and sent to America to fight his battles, very few German military pistols came to America. This was mainly because in those days the only pistol users among the rank and file were seamen and mounted troops. There was no German naval demonstration, and there were exceedingly few German mounted troops in the war; no cavalry, but sometimes mounted chasseurs. The single type shown—picture No. 17 — is the only one available which can with reasonable certainty be declared to be Revolutionary. There must have been variations on this type, because the Germans came from six different petty states, each of which furnished its troops with arms, and these states did not get all their arms from the same source. It is probable that all of them, however, bought some of their arms from Frederick the Great of Prussia (1740–1786), whose arms factories, especially those at Potsdam, were very busy.

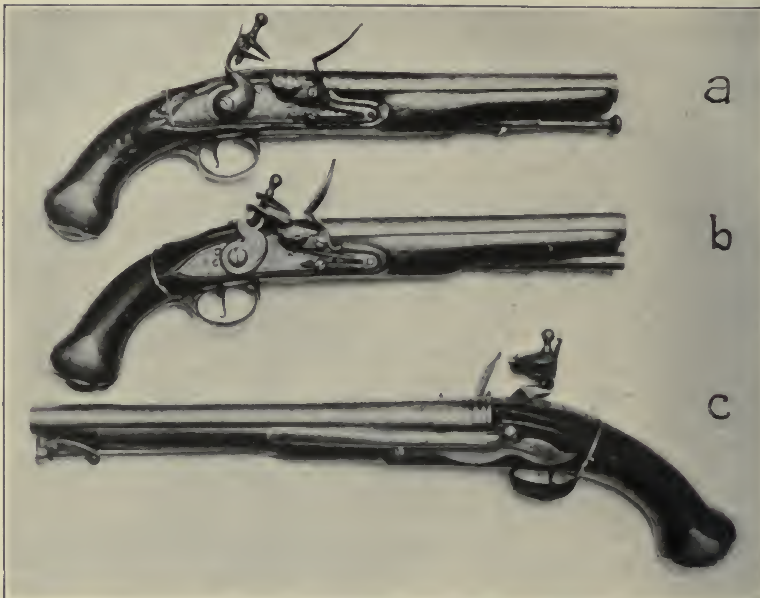
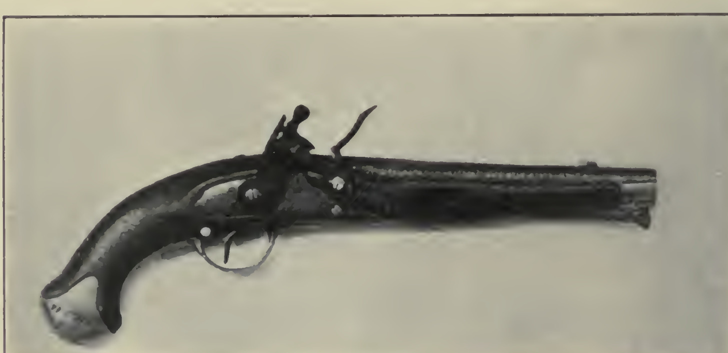


PLATE No. 17. — English Regulation Pistols



German Regulation Pistol

THE GERMAN REGULATION PISTOL SHOWN

PLATE No. 17

Length 16½ inches; barrel length 9⅜ inches; caliber about ⅝ of an inch. Marks on lock — Potsdam, G S, and a small crown.

REGULATION PISTOLS OF THE FRENCH ARMY AND NAVY

In American Revolutionary time there was greater uniformity in the small arms of the French soldiers and sailors than in those of any other nation; hence they are easier classified, and there is less chance of mistake as to model, date of first issue, and contemporary use. The royal (government) arms factories were at Charleville, St. Etienne, Maubeuge, and Tulle. The year of the model was engraved on the tang, preceded by the letter M. The year of make was engraved or sometimes stamped on the breech. As these marks were often very lightly cut, they were liable to disappear by the erosion of rust and cleaning. The name of the factory was engraved on the lock, in script; different engravers used their individual styles of letters and abbreviation. The pistols made at Tulle were for sea-service and the Colonies. Only three models of regulation pistols could have been used in the war — models 1763, 1773, and 1777. There was no regular model before 1763. All three models were

produced long after 1777. These three models are frequently found marked Libreville. Although correct in appearance, they were not in existence at the time of the war. The name Libreville was substituted for that of Charleville during the early part of the French Revolution (1789–1799), when anything named after royalty, or that in any way suggested it, was abolished. Navy pistols and army pistols were alike in size, shape, and caliber, but those intended for the navy were made with brass bands for models 1763 and 1773. All three models were supplied with belt hooks for either army or navy. In times of shortage army pistols were supplied to the navy and vice versa. Such are still in existence. Officers ranking as captain or higher were supplied with the elegant arm shown in picture No. 18, pistol No. 4. This is the only known model of government issue officer's pistol of the time of the war. It is not known to have had a belt hook. The small government pistol numbered 5 is the gendarme or police pistol. While not intended for use in the army or navy, it was nevertheless a popular pocket pistol with officers of low and medium rank.

THE FRENCH REGULATION PISTOLS SHOWN

Plate No. 18

1. Model 1763. Length $15\frac{1}{2}$ inches. Caliber $\frac{11}{16}$ of an inch. Marks on lock — Mre de Charleville. On tang — M 1763. Iron mounted.

2. Model 1773. Length 16 inches. Caliber $\frac{11}{16}$ of an inch. Marks on lock — Manufacture de St. Etienne. On tang — M 1773. Brass mounted.

3. Model 1777. Length $13\frac{1}{2}$ inches. Caliber $\frac{11}{16}$ of an inch. Marks on lock — Charleville. On tang — M 1777. Iron frame, back straps, and belt hook, brass guard.

4. Model 1763. Officer's pistol. Length 12 inches. Caliber $\frac{11}{16}$ of an inch. Marks on lock — Manufre Royale de St. Etienne. Brass mountings, carved beneath. Set trigger.

5. Model 1763. Gendarme pistol. Length $9\frac{3}{4}$ inches. Caliber $\frac{5}{8}$ of an inch. Marks on lock — Manufacture de Charleville. Iron mounted.

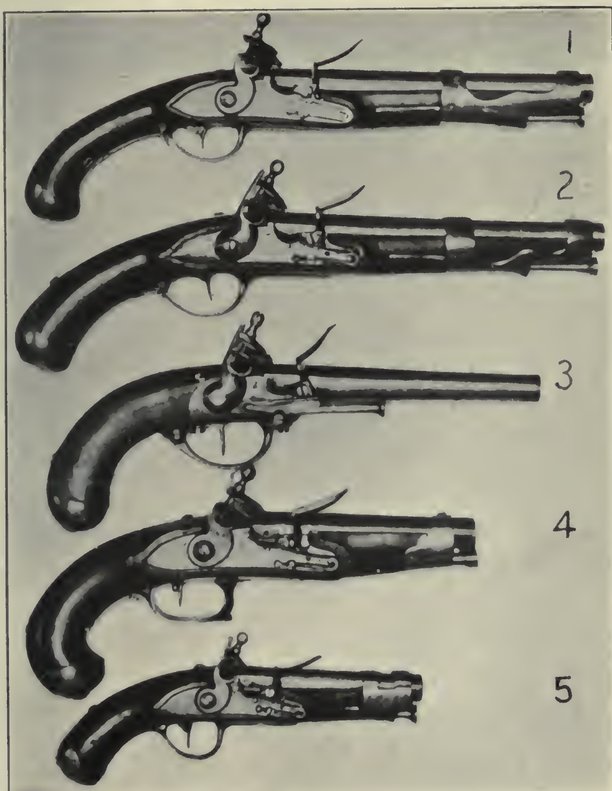


PLATE No. 18. — French Regulation Pistols

REGULATION PISTOLS OF THE AMERICANS

Cavalry and marine pistols were not much used by the American Continentals during the Revolution. The American "cavalry" was really a mounted infantry, and the American navy dwindled from thirteen small vessels in 1776 to none in 1780. There were, of course, some pistols furnished by the Continental Congress, but no records regarding them have yet been found. Only such as Congress furnished belong in the classification as Regulation. The other pistols in use by the Continental privates were, when not either old or personal property, Committee of Safety arms. In the absence of discovered records of Committee of Safety pistols it is fair to assume that they were made by the same shops and men who furnished muskets. There is reason to believe that they would be copies of well-known existing types such as those shown by Plate No. 17 and Plate No. 21, *b*. Rappahannock Forge, established near Fredericksburg, Virginia, by act of the Virginia Legislature in June, 1775, and destroyed by fire in 1780, is one armory known to have made

Committee of Safety pistols. Although the official navy was next to nothing, the unofficial navy was a great power — the privateer navy. It is believed that during the war 70,000 New Englanders alone engaged in privateering; they must have purchased immense quantities of newly made American pistols. There is at present no way to differentiate Committee of Safety (public service) and Privateer (private service) pistols, but it may be possible if the bills of sale ever come to light. Besides Committee of Safety pistols the cavalry and navy used what they captured, and a few — estimated at two hundred — which Lafayette brought in 1777 in his present of arms. Lafayette had purchased the bulk of them during his recent visit to England, and if not all of them at least most of them were of the Sharpe and Ketland type shown by Plate No. 21, *b*. Personal property pistols of assorted kinds were in use also.

MISCELLANEOUS PISTOLS OF THE OFFICERS

In the time of the American Revolution, before, and for decades after, there was, apparently, no law, rule, or custom fixing the kind of pistols which a commissioned officer should use. France furnished an excellent arm to those desiring the free use of a government weapon. (See No. 4 of Plate No. 18.) England furnished plain, substantial pistols for those who requested them, such as are shown by Plate No. 21, *b*, but their use was not obligatory. German and American officers apparently were given no other grade of weapon than the regulation trooper's. If anything different was wanted, an officer was expected to furnish it. The American officers, not being in the service as a life profession, used what they could get, as good enough for their temporary needs. But the professional military leaders of the foreign governments had great pride in their weapons, and each lavished his pay upon a small arsenal of magnificent pieces. Hence about every kind of flint pistol then known in Europe was brought to America. They classify as single-shot,

two-shot, three-shot, four-shot, and so forth. In each variety the attempt is made herewith to show the markedly distinct kinds judged by the standards of size, shape, decoration, material, and mechanism. Each of these kinds has a host of minor variants not necessary to enumerate. Many of them belonged to the Colonial period, and are classified with Revolutionary only because of use then.

SINGLE SHOT MISCELLANEOUS PISTOLS OF THE OFFICERS

Plate No. 19

a. Pocket pistol, center hammer. This tiny weapon is only 4½ inches long, and is intended for the vest pocket. The barrel is 1⅜ inches long, and the ball comes about flush with the muzzle. The barrel unscrews to load at the breech. One end of the bullet mold has a ring with a slot in it. The ring slips over the barrel, and a stud on the barrel enters the slot, so that the bullet mold serves as an unscrew lever. Metal parts are engraved. The handle is of walnut, checkered. The trigger is hinged and folds into a recess in the frame, out of the way (folding trigger, so called). It flies out upon raising the cock. Upon the top of the frame there is a slide which engages both cock and frizzen when they are upright and locks them in that position for safety. A single movement forward or backward engages or disengages both at once. Caliber about ½ inch. English make.

b. Pocket pistol, center hammer, barrel unscrews

by ringed lever. An all iron pistol. When new was covered with engraving. Length about 6 inches, barrel $2\frac{5}{8}$ inches, caliber about $\frac{7}{16}$ of an inch. Probably Scotch make — no marks legible.

c. Pocket pistol, center hammer, barrel unscrews by ringed lever. Brass barrel and frame. Folding trigger. Lock, frizzen, and trigger blued. Handle of fancy walnut. Length $6\frac{7}{8}$ inches, barrel $3\frac{1}{8}$ inches; caliber about $\frac{7}{16}$ of an inch.

d. Pocket pistol, center hammer, barrel unscrews by ringed lever. Iron barrel and frame. Cock, frizzen, and trigger blued, other metal browned. Handle of fancy walnut. Thick and heavy silver butt, embossed, having the Birmingham hall-marks of 1776. Length $7\frac{3}{4}$ inches, barrel $3\frac{1}{2}$ inches, caliber $\frac{7}{16}$ of an inch; old London proof-marks. A pair like this is said to have belonged to General Wolfe, who, as he lay dying upon the Plains of Abraham, presented them to his surgeon as a memento and mark of esteem.

e. Large pocket, center hammer, blunderbuss pistol with spring dagger. Rigid barrel. Brass frame and barrel. Steel parts polished bright. Wood of handle unidentified, checkered and carved. Length $9\frac{1}{4}$ inches, barrel $4\frac{1}{2}$ inches, caliber at muzzle nearly $\frac{7}{8}$ of an inch. The dagger folds under the barrel and is made secure in that position by the engagement of

its point with the trigger guard. Drawing back the trigger guard allows a strong spring to throw the dagger into its forward locked position. The French in later days (under the Directorate) issued this type as an officer's arm, calling it "L'Ecossaise à bayonette."

f. Pocket pistol, rigid iron barrel. Brass butt and guard, silver wire scrolls inlaid in the wood. Length $7\frac{3}{4}$ inches, barrel $3\frac{1}{2}$ inches, caliber $\frac{7}{16}$ of an inch. Marks on lock — Parr; on barrel old London proof. Termination of fore end rather unusual.

g. Large pocket pistol. Iron barrel and furniture, no metal cap on butt. Length 10 inches, barrel $4\frac{5}{8}$ inches, caliber $\frac{11}{16}$ of an inch. Marks — Prosser, London, and old London proof.

h. Large pocket blunderbuss pistol. Brass barrel beautifully embossed on breech. Length $8\frac{1}{2}$ inches, barrel $4\frac{1}{2}$ inches, caliber at muzzle about 1 inch. Marks — Twigg, London.

i. Holster blunderbuss pistol. Iron barrel, brass mountings. Length 12 inches, barrel $6\frac{1}{4}$ inches, caliber at muzzle $1\frac{1}{8}$ inches. Embossed and engraved. Carried in holster attached to the person, or to saddle, or inside carriage.

Elliptical mouth blunderbuss pistols were also in use. No specimen contemporary with the war available for illustration.

j. Holster pistol; generally slung inside a carriage and so called carriage pistol. An enlarged pocket pistol, slender and requiring little space. Embossed silver griffins, head butt; silver name shield; engraving. Length 12 inches, barrel 6½ inches, caliber about $\frac{19}{32}$ of an inch. Rigid barrel. Marks — Henry Hadley, London. The Virginia Historical Society claims that a pistol of identical type was used by Captain John Smith of Jamestown fame; he died in 1631.

k. Holster or carriage pistol, center hammer. Barrel unscrews to load at breech by means of a toothed stud on end of bullet mold handle, fitting into notches inside the muzzle. Silver wire scrolls inlaid in the wood. The notches, either V-shaped or square bottomed, in the muzzle of a pistol, are frequently mistaken for rifling. They were intended only as a means of securing a hold upon the barrel with the unscrew lever, and do not extend far down the barrel nor have a twist.

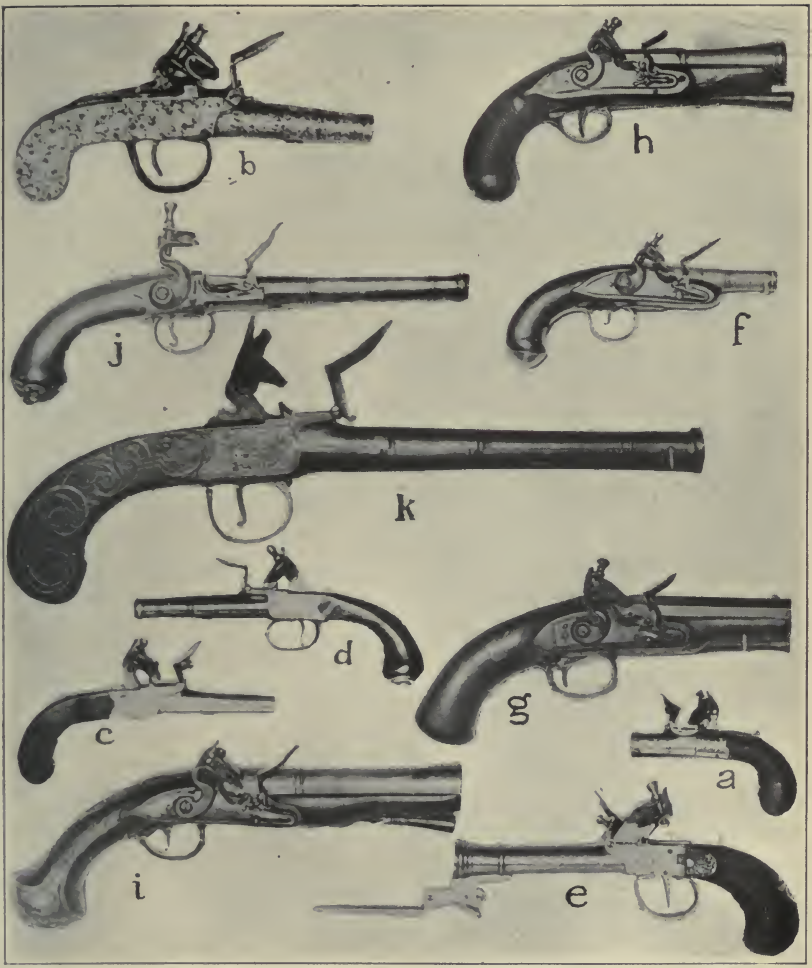


Plate No. 19. — Single Shot Miscellaneous Pistols of the Officers (Pocket and Carriage)

HIGHLANDER PISTOL — A DISTINCT TYPE

Plate No. 20

All iron and steel. Length $13\frac{3}{4}$ inches, barrel $8\frac{3}{4}$ inches, caliber about $\frac{9}{16}$ of an inch. Ball trigger made without guard. Belt hook on left side. Lock marked R C, the mark of Robert Caddell, of Doune, Scotland, who worked between the approximate dates 1670 and 1710. Barrel, frame, and handle engraved with conventional forms of thistle leaves. Mechanism of lock differs from that of the regular flintlock, and sear extends through lock plate and blocks the cock at safety. This pistol said to have been taken by John Scott, a Minute Man of Winchester (now) Massachusetts, from a British soldier whom he shot April 19, 1775, while the British were retreating towards Boston. The pistol was then seventy-five to one hundred years old. The first shot of the Revolutionary War, fired April 19, 1775, by Major Pitcairn at Captain Parker's men on Lexington green, was from a Highlander pistol. Major Pitcairn had in his saddle holsters a pair of very elaborate and beautiful Highlanders. A few hours

after he fired that momentous first shot he fell, wounded, from the saddle, and his horse dashed into the American lines bearing the pistols. They were carried during the war by General Putnam, and are now the property of the town of Lexington, on exhibition in the Hancock-Clark House. The Highlander type of pistol is supposed to have been developed from the all-steel German wheel-lock pistols. The earliest dated Highlanders at present known are in the Museum of Dresden, and bear the date 1598 and the armorer's initials F. K. There are a pair of them, one left-handed, the mate right-handed, snaphance. Highlander pistols were commonly made of steel; occasionally of copper, brass, bronze, or combinations of metals in the same arm. Steel ones were generally finished bright when new, but were sometimes blued. They were generally single shot and smooth bore, but there are in existence a few multi-barreled ones, and one or two with rifling. Highlander pistols were undoubtedly created to meet the demands of Scotch chieftains for beautiful and showy weapons with which to decorate the belt or the sporran. The sale of cattle at Downe, Dundee, St. Andrew's and other towns on market days provided funds wherewith to acquire these expensive weapons, the price of which averaged from about fifty dollars per pair, of present

money, for plain ones, to about six hundred dollars per pair for elaborately ornamented ones. The outlaw Rob Roy, made famous in Scott's novel, owned a beautiful pair. Practically all Scottish chiefs had them, as also did English and Continental nobility about 1700 to 1750, and army officers. As weapons they were more showy than useful. Their light weight and large bore were productive of an amount of recoil unpleasant to the user and detrimental to accuracy. Highlander pistols ceased to be made in Scotland early in 1800, but English and Continental copies were made in flint and percussion during the first third of the nineteenth century.

FAMOUS MAKERS OF SCOTCH HIGHLANDER PISTOLS

Researches of Monsieur Georges Stalin

NAMES AS THEY APPEAR ON HIGHLANDERS	TOWN	DATE
Smith	St. Andrew's	1585
Alison, father and son	Dundee	1586
Gordon	Dundee	1586
Alex. Pryde	St. Andrew's	1594
F. K.		1598
P. H.		about 1690
A. M.		1611
A. T.		1611
I. M.		about 1600
I. A. (J. Alison)		1613

NAMES AS THEY APPEAR ON HIGHLANDERS	TOWN	DATE
R. A. (Robert Alison)		1614
C. A. (C. Alison)		1619
J. B.		1613
H. H.		1615
A. G.		1622
E. C.		1627
McKen(zie?)	Glasgow	1627
R. M.		1630
I. C.		about 1630
A. D.		about 1630
R. C. (Robert Caddell)	Doune	1675
Tho. Caddell	Doune	about 1650
Thos. Caddell	Doune	died in 1767
Andrew Scott		about 1675
Daniel Stevart		1696
Andrew Strahan	Edzell	about 1680
John Campbell (probably the marks I. C. were the early ones of this Campbell)	Doune	about 1680
Alexander Campbell (probably son of John)	Doune	about 1725
John Campbell (probably son of Alexander)	Doune	about 1775
Alexander Murdoch	Doune	about 1775
T. Murdoch or Murdock	Leith	about 1775
I. Murdoch		
Io. Murdoch		
John Murdoch		
Io. Murdoch (different signatures, same man)	Doune	about 1775 to 1800
Shiel	Doune?	

NAMES AS THEY APPEAR ON HIGHLANDERS	TOWN	DATE
James Sutherland	Doune?	
James Paterson	Doune	about 1775
John Paterson	Doune	
S. Michie	Doune?	
Jo. Michie		
Jo. Stuart (J. Stuart)	Doune?	1701
Jas. Chrystie	Perth	1771
Jas. Christie	Perth	1794
J. Christie (the same?)		
Jo. Chrystie	Doune	
John Christie	Stirling	
Jon. Christie (the same?		
William Christie	Stirling	
Jas. McKenzie (IA — MK)	Dundee?	about 1700
David McKenzie (son of Jas)	Dundee	
Moncur	Dundee	
McGlasham	Perth	
John Smith	Perth	
Bissel	Birmingham or Perth	about 1760
W. Hunter	Stirling	
D. H. (David Hunter?)		
Hunter	Edinburg	about 1790
John Burgess (J. B. E.)	Elgin	
Forbes	Elgin	
Alexander Shires	Old Meldrum	1700
David Dunbar		
J. Moore		
Alexander Cameron (Cameron)		
McKay		

NAMES AS THEY APPEAR ON HIGHLANDERS	TOWN	DATE
Daniel McNab	Dalmally?	
Charles McCulloch	Inverness	about 1725
J. McRosty		
Wood		
Kennedy		
John Petcairn		
Daniel Walker	Dunbarton	about 1810
* McLauchlan	Edinburg	about 1810
* Ross	Edinburg	about 1810
* Playfair	Aberdeen	about 1810
* McLeod	Perth	about 1810
Robert Ancell	Perth	1833

* The pistols of these men, almost always of cast iron, were intended only for decoration.

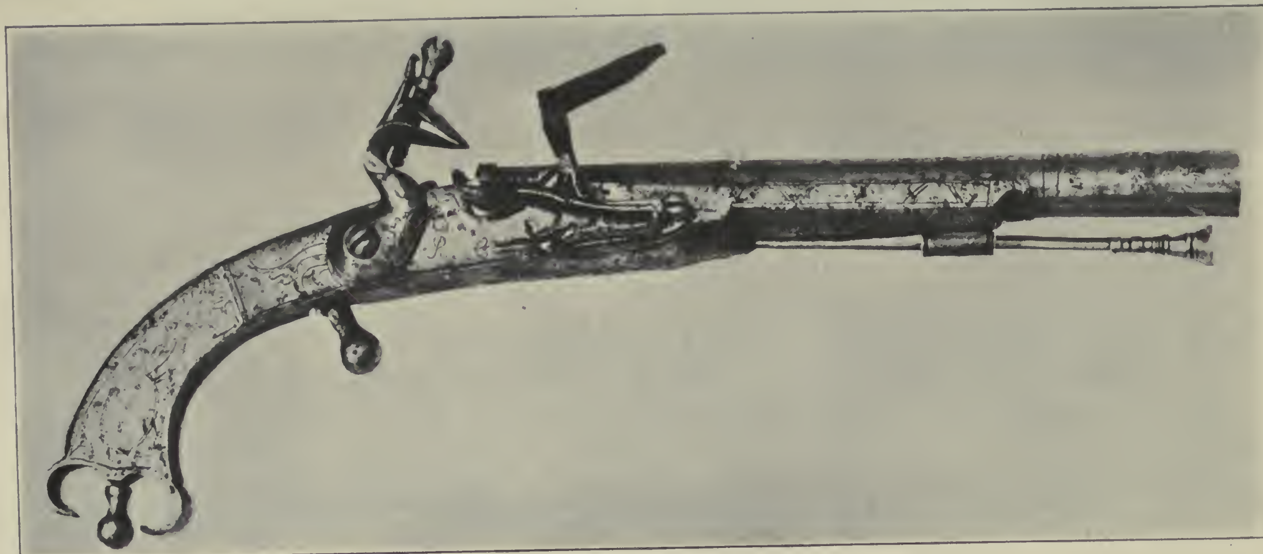


Plate No. 20. — Highlander Pistol

SINGLE SHOT MISCELLANEOUS PISTOLS OF THE OFFICERS — CONTINUED

PLATE NO. 21

a. Left-side lock holster pistol. Octagonal iron barrel, German silver mountings engraved. Length $14\frac{1}{4}$ inches, barrel 9 inches, caliber $\frac{5}{8}$ of an inch.

b. Holster pistol — perhaps the commonest non-regulation horse pistol of the period. Length 14 inches, barrel $8\frac{1}{2}$ inches, caliber $\frac{9}{16}$ of an inch. Brass barrel and mountings, a minimum of engraving, plain woodwork. Marks on lock — Sharpe; on barrel — Extra Sharpe Proof, and old Birm. proof. The house of Sharpe seems to have lasted for several generations.

c. Holster pistol, high grade. Brass barrel, half octagon and ringed, silver mountings, side plate has base of flags, name shield is of elaborate design, embossed grotesque head on butt. All the silver is thick and heavy. Length $13\frac{1}{2}$ inches, barrel $8\frac{1}{4}$ inches, caliber about $\frac{5}{8}$ of an inch. Marks — Brander, London. The house of Brander existed from early in 1600 to near the present century.

d. Holster pistol, high grade. Iron barrel with in-

laid silver armorer's mark. Brass mountings. Wood, iron, and brass beautifully tooled. Length 15½ inches, barrel length 9¾ inches, caliber about ½ inch. Italian make.

e. Holster pistol, high grade, extra size. Magnificent specimen. All silver mountings thick, heavy, beautifully embossed and engraved. Damascus-twist barrel of uncertain make, perhaps imported from Damascus. Pistol assembled and decorated probably in Germany. Figures in costume, hunting scenes and trophies. Length 19½ inches, barrel length 13⅜ inches, caliber about $\frac{9}{16}$ of an inch.

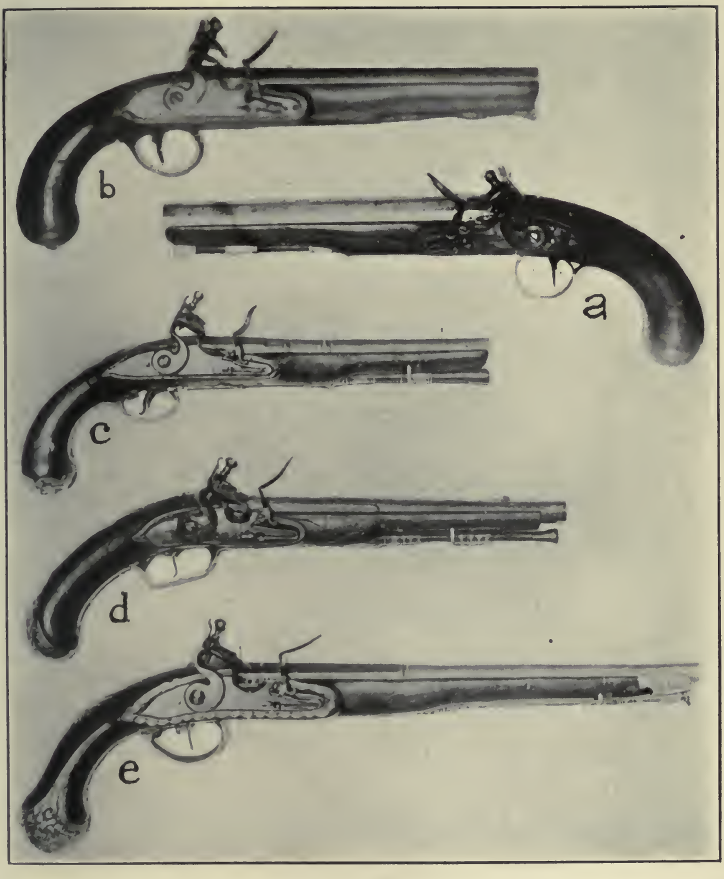


PLATE No. 21.—Miscellaneous Pistols of the Officers, Holster Size

DUELING PISTOLS

Plate No. 22

Set of dueling pistols in mahogany case with apparatus. Dueling, although forbidden, was nevertheless, in vogue, and every officer who laid claim to elegance owned a set of beautiful dueling pistols. A "set" meant a pair so exactly alike as not to be told apart, contained in a case of rare wood. The person challenged had the right to choose either pistol of a set, hence the care to make both pistols exactly alike. The case was divided into compartments, nicely lined, and held besides the pistols all needful apparatus.

A dueling pistol differed from a military or other large pistol mainly in the care taken to make it a weapon of precision. Thick barrel carefully bored, front and rear sights, and set trigger were distinguishing marks of the dueling pistol. In addition, fashion in the period of the war had set the form and size shown in the picture as correct. A dueling pistol was made with great care by skilled workmen, was elegant of form, right in balance, superb in fitting, finish, and mountings, and was usually

bedecked with more or less gold. Incidentally it cost a good deal of gold.

Although everything known was done to make it an instrument of precision, it was far from being such. Twenty yards was about its limit for effectiveness; duels were commonly fought at ten yards; at that distance the pistol if correctly held should put three consecutive shots within a three-inch circle. Better shooting could be done at shorter range. Approximately speaking, its error increased with the square of the distance.

In regard to the set illustrated, each is 15 inches long, is $\frac{9}{16}$ of an inch smooth bore, using 26 round balls to the pound, and has a 10-inch octagonal barrel finished in the plum brown popular at that time, and showing the figure of the twist. The fore and rear sights are cut fine; the mountings are of steel, polished, blued, and engraved. The high grade of the arm is made plain by its lock of utmost elegance of form and perfection of finish with such refinements as safety catch, rainwater drains, adjustable hair trigger; thick and wide gold bushing to the touch-hole, gold bands inlaid in the barrel and gold name-plate; removable screw-plug opposite touch-hole for insertion of powder when bullet is carelessly seated without it; the wood of hard close-grained Circassian walnut figured and finished

Plate No. 22 — Dueling Pistols

like rosewood; checkered grip; elegant ramrods tipped with ivory and steel; the whole making a weapon not merely of utmost serviceability for its purpose, but at the same time of such good taste as to be a work of art. Such arms as these being treasured by their owners, and also being seldom used, it is not surprising that this set is to-day nearly as new in appearance without and within as 150 years ago. The maker's signature, Ryan and Watson, of London, is engraved on the lock of each. The compartments of the box or case hold snugly fitted besides the pistols a jointed wiping rod with assorted heads and brushes, a driving rod, powder flask, bullet mold, ebony-handled screw-driver and picker, queer pewter oiler, spare flints and a supply of bullets. The original cost of this set was probably 30 guineas, or about $200 of modern money.

Just a certain name on a garment raises its merits in the opinions of some people, so in dueling times certain makes of dueling pistols were more esteemed —more fashionable—than others. Some of the celebrated English makers of dueling pistols of Revolutionary War time and the generation before were —Henry Nock, D. Egg, Twigg, Wogdon, Vaughan, Hawkins, Ryan & Watson, J. & W. Richards, Philip Bond, and F. Page. It is not now possible to place any one of these men as the leader.

OFFICERS' PISTOLS, MULTI-SHOT

Plate No. 23

a. Pocket pistol, two shots, over-and-under barrels which unscrew for loading at the breech, center hammer. Length 7½ inches, barrels 2⅝ inches, caliber about ½ inch, bright finish. Nicely engraved. In the pan are two touch-holes; one, opening in the front of the pan just above the bottom, communicates with the upper barrel; the other opens from and passes through a revolving cylinder which forms the bottom of the pan. The cylinder is operated by a small lever at the left side of the frame. When the lever is horizontal the touch-hole in the cylinder is revolved out of the way and only the upper barrel can be fired. When the lever is snapped down to the perpendicular one end of the hole through the cylinder is in the pan and the other communicates with the under barrel. The pan has to be re-primed for the second shot. By turning the lever only half way — to an angle of 45 degrees — both barrels can be fired at once. Common variations on this type — all iron; iron barrels with brass frame; brass barrels with iron frame; all brass; all metal except wooden

handles; any one of these variants equipped with a dagger.

b. Pocket pistol, two shots, over-and-under barrels which unscrew, center hammer, concealed folding trigger. Length $6\frac{1}{4}$ inches, barrels $2\frac{1}{4}$ inches, caliber about $\frac{7}{16}$ of an inch. Revolving cylinder as with *a.* On account of the folding trigger the pistol occupied less space in the pocket than one with a guard, and was less liable to accidental discharge when carried in the pocket at fullcock.

c. Pocket pistol, two shots, side-by-side barrels which unscrew, two cocks, two pans, two triggers which fold into recesses in the frame and fly out at cocking. Each cock and frizzen is provided with a safety like that of *a*, Plate No. 19. Length 8 inches, barrels $2\frac{3}{4}$ inches, caliber $\frac{7}{16}$ of an inch. On the silver name shield is engraved — Culloden Moor, 1746. The Battle of Culloden Moor was the last which took place in the British Islands. This kind of pistol (center hammer) was common with the usual triggers and guard, and in iron, brass, and the combinations.

d. Pocket pistol, two shots, side-by-side barrels which unscrew, single center hammer, single frizzen, two pans covered by the one frizzen. On the left side of the frame a slide operates a cover for the left pan. Either barrel can be fired at will or both at

once. As, with this kind of pistol, no re-priming is necessary between the first and second shots, it has the quickness of the side-lock double-barrel pistols without their bulk. It is questionable, however, if the flash from one pan would not generally fire the other. Finely engraved silver wire scrolls inlaid in the wood. Silver butt embossed with grotesque head.

e. Pocket pistol, three shots, two barrels side by side and one centrally under them, all three rigid. Single center hammer, revolving cylinder in pan, three touch-holes; one opens from the front of the pan and communicates with the right-hand barrel; the other two, opening from the cylinder, communicate, according as the cylinder is turned, with the left-hand and lower barrels. The lever which operates the cylinder can be adjusted so that all three barrels can be fired at once. The dagger operates like that of pistol *e*, Plate No. 19. There is the usual safety. Finely engraved. This kind of pistol was also made in iron, brass, and the combinations.

f. Pocket pistol, four shots, two barrels above and two below; two cocks, two pans, and two triggers, one set for each pair of perpendicular barrels; barrels rigid. The principle is the same as combining side by side two pistols like *a*, above. Any barrel can be fired at will or all four at once (in the latter case, prob-

ably for once only). Polished steel. Finely engraved. Embossed silver butt. Checkered and carved handle with mother-of-pearl inlaying. Fine and expensive weapon. Length $8\frac{5}{8}$ inches, caliber $\frac{7}{16}$ of an inch. French make.

g. Pocket pistol, four shots, four barrels, four pans and their frizzens, two cocks and two triggers. The barrels seem to be made from one solid piece, and revolve, with pans and frizzens attached, on a common center. The barrels are held as shown by a catch; drawing backward the trigger guard withdraws the catch, when the barrels can be turned by hand. The safety acts only on the cocks; it has a knife-like projection which enters or leaves a slot in the rear of the cock. The handle is of horn. The face of the frame where the barrels bear is covered with a brass plate. The barrels and frame are of iron or steel. Length $8\frac{1}{2}$ inches, caliber about $\frac{5}{16}$ of an inch. French make.

h. Holster pistol, two-shot, shotgun style. Length 16 inches, barrels 10 inches, caliber about $\frac{19}{32}$ inches. Twist barrels. Brass mountings. Excellently well made.

i. Holster pistol, two-shot, one barrel over the other — sometimes called superposed or over-and-under. Barrels rigid. Two side locks, on a level. The under barrel is fired by the left-hand lock. The

two locks being on a level, and the right one communicating in the usual way with the upper barrel, the flash-pan on the left therefore has to extend downwards like a pit to reach the under barrel. The barrels at their forward part are almost as thin as paper. They are separated by about $\frac{3}{8}$ of an inch, and are given the look of strength by a wooden filling and side covering which, in one piece, was slipped between them and fastened in place. Since barrels that touch each other or support each other shoot away from each other, this woodwork is so cut as not to reinforce the barrels. Length $14\frac{3}{4}$ inches, barrels $8\frac{3}{8}$ inches, caliber $\frac{19}{32}$. Brass guard and butt, engraved. An old pistol at the time of the Revolution. Believed to have been brought by the Germans. Made by Erttel of Dresden, probably before 1650.

There are many variants to this type. The principal ones are — fixed barrels and two locks, with the left one set down to the under barrel; fixed barrels and one lock having a two-story pan; after firing the upper barrel the upper pan slides off, exposing the lower one; fixed barrels and one lock and one deep pan with plug — repriming necessary after the first shot; one lock and revolving barrels having pans and frizzens attached; one lock and one pan and frizzen, with revolving barrels.

Plate No. 23. — Multi-shot Pistols of the Officers

PLATE No. 24. — The Firearm that Shed No Blood

THE FIREARM THAT SHED NO BLOOD

This kind of firearm was used in the "best families" to light the fire on the cheerful old time open hearth. Poorer people used the combination of a chunk of flint, a piece of bent steel, and a tin cup of tinder. With pioneers the lock of the gun did duty instead. The unfortunates who had neither tinder box nor firearm tried to keep a constant supply of live coals, and, in the event of losing the fire, applied to a neighbor for a light. The tinder box was a domestic spark producer from about 1550 until matches came into common use — about 1835. The one illustrated was a good one in its day — evidently of early date. Later period ones had an oil well attached; the application of a drop of oil to the spark saved time and exertion in blowing. Tinder was commonly made of charred linen. A supply was kept in the hollow interior of the box, reached by a little door on the left side. The tinder box was commonly kept on the mantel shelf while the gun hung beneath. Thus the emblem of peace was in fact above the emblem of war. At the close of the Revolution, when the soldiers took home their guns, the firearm and the tinder box in close proximity looked good to reunited soldiers and matrons of the new United States of America.

THE PERIOD BETWEEN THE REVOLUTION AND THE CLOSE OF THE CENTURY

When the Revolution was over Thomas Paine voiced the belief of the American people in his statement, "The times which tried men's souls are over." It was entirely a mistake, for everywhere, without and within, trouble beset the republic. In addition to the political and economical fomentations caused by experimental and inadequate government, the hostility of the Indians culminated in a war in the "Ohio country" which dragged along for four years. The early attempts to suppress it with militia were utter failures, and success came only through the energy and ability of General Anthony Wayne and the fighting skill of his backwoods riflemen. England, France, and Spain imposed upon the thirteen pitiful republics bound together "with a rope of sand," and Hamilton said, "There is scarcely anything which can wound the pride or degrade the character of an independent nation which we do not experience."

There were two silver linings to the dark cloud.

One was the thriving condition of American commerce. The other was the might which weapons give. The westward movement into Indian country, the hostile foreign attitude, the need of the dwellers on the outskirts to supply their families with food by means of firearms, the necessity for a quantity of arms on every ship that put to sea, these and other causes made the firearms industry of prime importance, and besides the busy shops of the large towns there was almost literally a gunsmith shop at every cross roads. In the course of only one generation the internal chaos was replaced with order; the foreign attitude ceased to be menacing; and the republic stood on a firm and lasting base. The causes of healthy growth were honest purpose and endeavor, statesmanship, increasing wealth, and American arms.

It was in this period that state armories and the two national armories at Springfield and Harper's Ferry were established. Of the state armories the only enduring one was the Virginia Manufactory established at Richmond by act of the legislature of 1797, which continued to make and repair muskets, rifles, and pistols until 1865.

The Springfield Armory was of gradual growth. During the Revolution the town of Springfield was used as a recruiting post, depot for the storage of

military supplies, and place for the repairing of arms. The gunsmiths there at that time seem to have been working each for himself and in scattered houses and shops, at whatever jobs, state or congressional, they could get. Gradually the gunsmiths drew together upon the hill and formed a settlement by themselves. The magazine of government supplies remained below. The scattered and fragmentary evidence obtainable indicates that between 1781 and 1794 Springfield shops were employed in combination as a Massachusetts state armory. Military pistols were made there in 1787 — muskets may have been and probably were.

In 1792 Congress resolved that "the President of the United States be authorized to direct two arsenals and two magazines with necessary buildings to be erected in proper places, one to be situated to accommodate the Southern States." An arsenal was a storage place for arms, not a place of manufacture, which was an armory. In April, 1794, Congress enacted that the President was empowered to establish one or more places for the manufacture of arms. Washington chose Springfield, which he had visited, as the site of an armory, and Harper's Ferry, Virginia, as the best location for another, to accommodate the Southern States. Congress thereupon set aside $340,000 to be applied, under direction of

the President, in the purchase of stores and arms (April 2, 1794). A part of this money was used for the purchase of muskets from private gun makers. From the remainder a beginning was made in the matter of land, buildings, and equipment. One hundred and twenty-five acres of land were purchased that year from the heirs of Robert Harper, and three hundred and ten acres from Mr. Rutherford soon after, and the erection of the Harper's Ferry buildings begun. In 1796 the manufacture of arms began under Mr. Perkins, superintendent. The Springfield Armory had already begun, in 1795, to manufacture under David Ames, superintendent. This quick start was due to the utilization of government buildings already standing convenient to water power. So far as is now known, muskets only were made at both places previous to 1800, and of them but few because of the small number of workmen; Congress had enacted that the total number of workmen which could be employed in government armories should not exceed one hundred. Owing to a muddle of some kind the two new armories began operations with a majority of workmen who were not gunsmiths, and who knew little or nothing about the business. Both factories endeavored to produce exact copies of the French infantry musket of 1763 model; neither factory was equipped with adequate

machinery, or even with machines for making small parts alike, but was obliged to depend upon hand labor.

The first gunlock made at Springfield was filed by hand by Alexander Crawford after a struggle of three days. There were forty employees only the first year at Springfield Armory, and they succeeded in making only 245 muskets, or less than one per day. In 1796 they made 836 muskets, in 1797 1028, in 1798 1044, in 1799 4595, and in 1800 4862, the rapid increase being due to the efficient teaching of Robert Orr, the master armorer. At Harper's Ferry the production was far lower.

The output of the two armories, plus the contractor arms of 1794, plus the old arms on hand, being insufficient to the needs to the army and the militia, the purchase of arms in quantity became necessary. In 1798 Congress authorized the purchase of thirty thousand stands of muskets, and, bearing in mind Washington's plea of some years past for the encouragement of home manufactures, awarded contracts to Eli Whitney, D. Gilbert, and McCormick, all Americans, and advanced money to each. So far as known neither Whitney (the cotton-gin inventor) nor Gilbert (a prominent lawyer, manufacturer, and politician of Brookfield, Mass.) had ever made a gun before. McCormick is believed to

have made arms in connection with large business enterprises of previous times, and may have been one of those who furnished part of the 1794 muskets. All three proved worthy of the trust, and produced excellently made muskets as evidenced by specimens still in existence. Of the three, Whitney was the ablest from the mechanical point of view. He introduced with success the innovation attempted unsuccessfully by France some years before of interchangeability of parts formed from stampings and finished to gage. He built factory buildings, supervised the making of all tools and machinery upon the premises, and produced the first American guns made and finished almost entirely by machinery. He was ten years in fulfilling his contract, but at the end of that time he had an arms factory which operated far beyond his lifetime, while the other two contractors had had enough of the tribulations of the business. The arms produced by the three contractors were unlike, and unlike those of Springfield and the Ferry — unlike in details, but they corresponded in generalities. All three contractors stamped their arms with their name and the date when the gun was finished.

It was about this time that locks for firing cannon came into use in America. They were first used in the English navy, invented or introduced by the

British admiral Sir Charles Douglass about 1780, and were taken up by the Americans between 1785 and 1790. It is not known that any were made before 1800 at the government armories; they were purchased of the English contractors. A cannon lock consisted of a brass box containing a gunlock mechanism, and having a cock and frizzen upon its upper face, with a trigger lever at the rear containing an eye for attaching a lanyard. The lock fastened to loops set into the breech of a cannon, and could be applied or detached almost instantly. It superseded the lighted match and the flash from a pistol, and had several advantages: the gunner could stand further from the cannon, and by having a series of lanyards attached to a single line could fire a whole battery simultaneously.

In the fifteen years preceding 1800 the double-barreled shotgun became the favorite birding-piece of the wealthy planters of the South and of the sporting sons of the rich merchants of the North. The principle was very old, and snaphance and flint double barrels of Spanish make were prized in the seventeenth century. They were good weapons, too, although long, poor in balance, and heavy on account of their size. The popularity of the double gun came about through the perfections devised and applied by the celebrated Henry Nock of London.

Nock made it short, with half stock, set the balancing point just in front of the trigger guard, inclined the axes of the barrels to a point about thirty yards in front of the muzzle, improved the ribbing of the barrels, improved the form of the powder chamber so as to get greater efficiency from the powder, improved the process of barrel boring to such an extent that his barrels were cylinders of almost mathematical correctness, made locks of wonderful refinements in workmanship, and made his guns not merely admirably serviceable weapons, but guns of beautiful grace and finish also. His patronage by the nobility brought him fame which culminated in his becoming gun maker to the king. His works were brought to the United States by those able to afford them, and became the inspiration of the gunsmiths there, just as they inspired the youthful Joseph Manton in Nock's own city; but with this difference, that no American achieved the fame of the master, while Manton, in middle life, became more famous than his teacher.

Among American gunsmiths of this period noted for ingenuity in fashioning sporting weapons was the John Golcher, of Easton, Pennsylvania, who had been employed during the Revolution in the Committee of Safety armory as instructor. After the war he devoted himself to the production of ingenious

novelties in that line. He became particularly celebrated for the accuracy and quality of his single lock over-and-under revolving barrel rifles, and for multi-shot arms having a single barrel to take superposed loads with traveling lock. Besides these he produced a variety of ingenious arms, the principles of which were probably new to him, as he had not the resources of travel and literature, but which were nevertheless old. In fact, in this the twilight of the flint period, it is questionable if any variety of firearms could be produced which had not been invented before. In some cases Golcher did a little better than his predecessors, and, if he had been favored by Fortune with a Colonel Hawker to advertise his skill, as was Manton, his celebrity would have been more in accord with his genius.

The close of the eighteenth century was marked by no radical changes in weapons of sport or of war. All civilized nations were using the flintlock for a firing mechanism, and its limitations were reached and could not be overstepped. Distinct progress in the mechanics and particularly in the science of firearms was still a score or more of years ahead. Since then the changes have been so great that nothing remains of the firearms of the early days of our country but the principle of using the energy

of explosion to propel a projectile, and a barrel to give direction to its flight. There are yet many problems to meet. Their solution may have more influence upon the future than the arms of our ancestors had upon the past.

CANNON LOCK

Plate No. 25

Length 6 inches, thickness $\frac{7}{8}$ of an inch, weight about a pound and a half. Marks—"W. Marwood," a crown over, and a crown in combination with the broad arrow. A cannon lock, when not in use, was kept in the arms chest. When cannon were cast to be fired by a lock the touch-hole was drilled in the side. When the lock was used with a cannon of the old style it fastened in a horizontal position on its side on top of the cannon, with the orifice of the pan in the touch-hole. In this latter case it was necessary to put a few grains of coarse powder in the orifice of the pan, to serve as a stopper, and then the fine flash powder. When primed this way the flash powder did not leak out, and the lock, so long as the frizzen was closed, could move about and be handled without limit, yet always be ready for instant use.

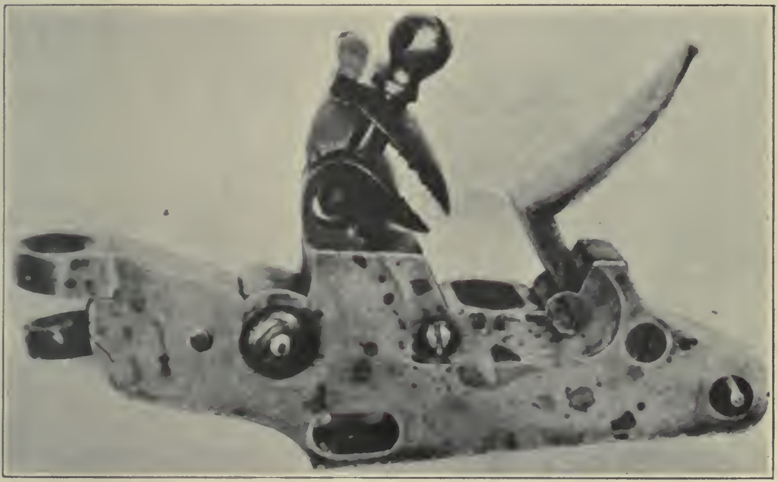


Plate No. 25. — Cannon Lock

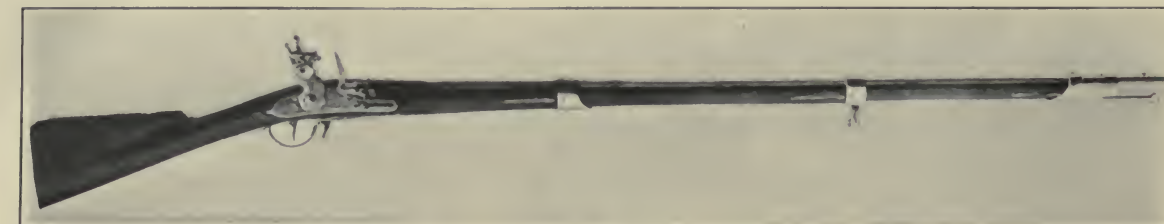


Plate No. 26. — U. S. Musket, Contract of 1798

MUSKET, CONTRACT OF 1798

PLATE NO. 26

Length 4 ft. 10 in., length of barrel 3 ft. 6¾ in., caliber about .69, taking 18 balls to the pound loosely. Weight about 8½ lbs. Marks on lock "D. GILBERT 1801." On the barrel there is a deep stamp that seems to be intended for a spread eagle, a large P for proved, followed by W, and the initials N R. The tang of the butt plate is stamped with the capitals A F. The wood bears for stocker's marks a number of seven-pointed stars. As Gilbert was not in the gun business, and old records indicate plainly that the first, last, and only guns of his output were those of the 1798 contract, this is a U. S. contractor musket in spite of the fact that it is not stamped U. S. It lacks 1½ inches of the length of a Model 1763 Charleville, the shortage being forward of the middle band; otherwise it is intended for an exact copy.

DOUBLE-BARRELED FLINTLOCK SHOTGUN

Plate No. 27

Length 44½ inches; length of barrels 29 inches; weight 6 pounds; gage 22; marks on barrels "H. Nock, London, Gunmaker to His Majesty" and on the under side of the breech "Patent" with London proof-marks consisting of an oval containing the interlaced letters G P beneath a crown, and another oval containing V beneath a crown. On each lock is a sunk oval of gold having, in raised letters, "H Nock," the H being above with a star each side of it.

The barrels are of stub twist, plum brown, and are very thin and light. The ribs are sunk, close fitting, and are smooth like the barrels. The touch-holes are $\frac{1}{16}$ of an inch in diameter, in the center of gold bushings having a diameter of ⅜ of an inch and extending through the thickness of the barrels. The object is to maintain constant size; gold does not erode from the effects of powder gases. By drawing out to the left the sliding key in the fore end the barrels can instantly be unhooked from the breeching and removed.

The word "Patent" stamped on the barrels does not refer to this feature but to the internal form of the breech at the powder chamber. The ramrod is of an unrecognized foreign wood, red, close grained, and tough as whalebone. One end has a German silver ferrule, cupped to fit a ball; the other has a wormer of the corkscrew type, enclosed by a metal cap. The locks are marvels of workmanship. Both cocks stand precisely the same at the down, the half, and the full. They rise to precisely the same pressure, beginning hard and going easier as they rise. The movement is exceedingly smooth, and the sears speak alike at the half and full bents. The tumblers are hung to the mainsprings with swivels. The pans are protected by rainwater drains, and the frizzens, bearing on rollers, are very quick and snappy in movement. The interior parts of the lock are finished to the highest degree, not in polish merely but in light, dainty, and ornamental forms, and ingenious offsets to prevent sticking, and reduced bearing surfaces to minimize friction. The mountings are of steel, nicely engraved. The wood is Mediterranean walnut, hard, close grained, and of handsome figure.

From whatever point of view this gun is seen it is graceful and beautiful; it is as perfect in design as a Greek statue. Its date of manufacture can be

established within five years. The word "Patent" on the breech of the barrels refers to the patent of April 25, 1787, and was of course stamped afterwards. The fact that the gun is not marked with the Prince of Wales' feathers, which Nock showed on his guns by permission constantly after 1792, indicates that the gun was made before. Hence it must have been made between 1787 and 1792.

The gold name shield bears an heraldic device. If it was worth while to spend a considerable amount of time merely to satisfy curiosity it would be possible to ascertain the identical man for whom this gun was made about fivescore years ago.

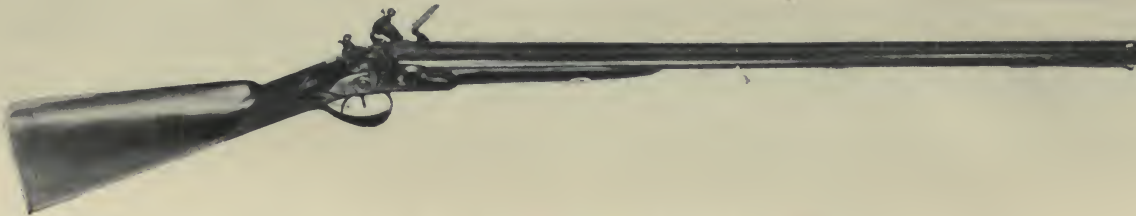


PLATE No. 27. — Double-barreled Flintlock Shotgun

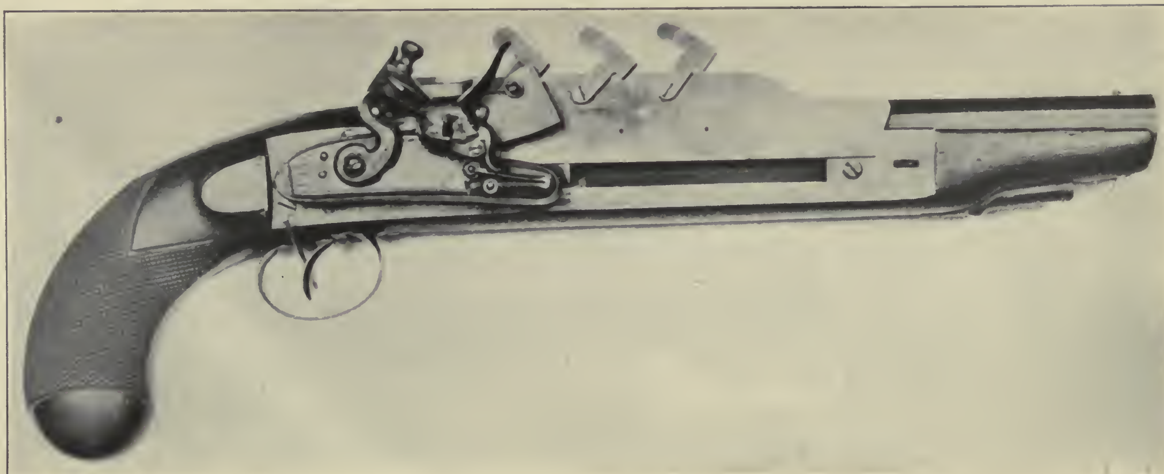


PLATE No. 28. — Four-shot Superposed Single Barrel Pistol

FOUR-SHOT-SUPERPOSED SINGLE BARREL PISTOL

Plate No. 28

Length 15 in., length of barrel 10 in., caliber about $\frac{7}{16}$ of an inch. The wood is American black walnut. The barrel is octagonal, smooth bore. The lock is marked "Golcher." The barrel is marked "Patent No. 54." The barrel was originally finished brown, the other metal parts blue, and the wood either waxed or oiled. The barrel hooks to the breech is held by a key, and with the face-plate, which is brazed to it, is instantly removable. The four touch-holes are minute, to avoid loss of energy when the rear charges are fired. The three rear ones can be covered by hinged caps. The lock mechanism is boxed, and projects about $\frac{5}{8}$ of an inch. The lock travels back and forth by hand between guides, and can be fixed in position at any touch-hole by the same hinged caps that cover the holes. The trigger acts upon a long bar, raising it as one edge of a parallel ruler is raised, and the bar throws the sear of the lock wherever the lock is. There is a priming magazine, operated by the movement of

the cock, which automatically flushes both the touch-hole and the pan with pulverized powder. The general design is ingenious and simple.

A long and careful search of the early and very incomplete patent records for No. 54 has been without result. In addition to this puzzle Golcher's son, a gunlock maker who lived to the middle of the next century, marked some of his locks in a similar manner. Hence this particular arm is offered subject to error as to its date of manufacture. But, whether made by Golcher senior or Golcher junior, whether made before 1800 or after, it is in essentials of design correct for the period preceding 1800.

A LIST OF GUN MAKERS, AMERICAN AND FOREIGN, WHOSE ARMS WERE USED IN AMERICA BETWEEN 1600 AND 1800

See also under DAGS, HIGHLANDER PISTOLS, RIFLES, and COMMITTEE of SAFETY ARMS.

The same family name or partnership name lasted, in some cases, during several generations. The capitals I and J, U and V, were in olden times used equivalently.

MASSACHUSETTS

Nathaniel Ames, Boston, 1800.

David Ames, Bridgewater, 1790. Became superintendent Springfield Armory in 1795.

Thomas Barnes, Brookfield, 1800.
John Bell, Boston, 1746.
Edmund Bemis, Boston, 1746.
Samuel Boardlear, Boston, 1796.
Enoch Bolton, Charlestown, 1665.
Richard Brooks (es), Boston, 1675.
John Cookson, Boston, 1727.
Joseph Cowell, Boston, 1745.
Thomas Earl, Leicester, 1776, famous.
Nathaniel Emmes, Boston, 1796 to about 1825.
Richard Falley, Westfield, 1776.
Thomas French, Canton, *b.* 1778, *d.* 1862.
Herman Garret, Boston, 1650.
Daniel Gilbert, Brookfield, *b.* 1729, *d.* 1824.
John Gerrish, Boston, 1709.
Richard Gregory, Boston, 1727.
John Hinds, Boston, 1745.
William Johnson, Worcester, 1787.
Ephraim Kempton, Salem and Boston, 1677.
Richard Leader, Boston, 1646.
Thomas Matson, Boston, before 1658 to after 1682.
John Merritt, Boston, before 1789 to after 1798.
John Odlin, Boston, before 1671 to after 1682.
Hugh Orr, Bridgewater arrived 1737, *d.* 1798.
Capt. John Penhallow, Boston, 1726.
James, Luke and Rufus Perkins, Bridgewater, 1800.

James Phips, Kennebec River, 1650. He was father of the William Phips who became Sir William and Governor of Massachusetts.

—— Pim, Boston, 1722. Made 11-shot repeater.

Elty (Eltwed, Eltweed, Eltwud, and Eltwood) Pumery or Pomeroy Boston, 1630; Dorchester, 1633–37; Hartford and Windsor, Conn., 1637–71.

Medad Pomeroy, Northampton, 1659–1716, son of Elty.

Eldad Pomeroy, Boston, Northampton, and Hampshire, 1630–62, son of Elty.

Lemuel Pomeroy, Northampton and Pittsfield, 1790–1840.

Ebenezer Pomeroy, Northampton, *b.* 1669, *d.* 1754, son of Medad.

General Seth Pomeroy, Northampton, *b.* 1706, *d.* 1777. Son of Ebenezer. Celebrated.

Thomas Ricks, Boston, 1677.

Benjamin Seward, Boston, 1796–1803. Absent in 1798.

Nathaniel Sherman, Boston, 1692.

William Waldren, Boston, 1671.

Alexsander Waldren, Piscataqua River, 1672.

Richard Waters, Salem, 1632.

Asa Waters, Sutton, 1776.

Andrus Waters, Sutton, 1776, *d.* 1778.

Asa Waters, Sutton, 1789–1841. Son of Asa.

Elijah Waters, Sutton. Brother of Asa 2d.

Amos Whittemore, Boston, 1775.

Luke Woods, Sutton, 1800.

John Wood, Boston, 1724.

VERMONT

Thomas Hill, Carlotta, 1800 (about 1790–1810?).

RHODE ISLAND

Stephen Jenks, Pawtucket, 1775.

Jeremiah Sheffield, 1775.

Jeremiah Smith, Lime Rock, 1770.

George Teff, 1775.

CONNECTICUT

Oliver Bidwell, 1800.

Simeon North, Berlin, 1800.

Nathan Starr, Middletown, 1793.

Ethan Stillman, Brookfield, 1800.
Ard Welton, Waterbury, 1778.
Eli Whitney, b. 1765; Whitneyville, 1798–1825.

NEW YORK

Govert Barent, New Amsterdam, 1648.
Joseph Finch, N. Y., 1800.
—— Vander Poel, Albany, 1740.
Francis Soleil, New Amsterdam, 1656.

NEW JERSEY

John Fitch, Trenton, 1771–1775; gun maker for Province of New Jersey during the Revolution. Invented steamboat.

John Miles, 1800.

Joshua Shaw, Bordentown, 1800. Also of Philadelphia. Disputed claim of invention of copper cap, percussion.

ENGLAND

LONDON

Those marked * — Member of the surveyors appointed by Charles I.
Those marked R. — Patronage by the Royal Family.

Thomas Addis, London, 1632.*
S. Anens, London, 1690.
—— Barbar, London, 1760.
——Barber, London, 1705.
Thomas Bays, London, 1785.
—— Bidet, London, 1790.
Philip Bond, London, 1776.
—— Brander, London, 1637–1850.
J. and R. Brooks, London, 1686.
Richard Burrows, London, 1632.*
——— Collumbell, London, 1743. R

Thomas Crodler, London, 1661.
William Dawsten, London, 1632.*
—— Dylaney, London, 1700.
—— Edge, London, 1759.
D. Egg, London, 1750.
Durs Egg, London, 1800 and later.
William Graves, London, 1632.*
John Green, London, 1775.
—— Griffin & Tow, London, 1796.
H. Hadley, London, 1789.
—— Henricke, London, in 1590; was at the head of English gunsmiths.
Abraham Hill, London, 1664.
William Jover, 1775.
—— Ketland, London; the London Ketlands are still a mystery.
—— Koster, London, 1620.
D. McKenzie, London, 1720.
John Manton, London, 1797 and later.
Joseph Manton, London; *b.* 1766, *d.* 1835 R; see footnote *a*.
P. W. Mortimer, London, 1789 R.
H. Martin, Muler, London, 1685.
Edmund Nicholson, London, 1610.
Henry Nock, London, 1780 R; see footnote *b*.
Nock, Jover & Green, London, 1775–80.
John Norcott, London, 1632.*
—— Parr, London, 1750.
John Pasmore, London, 1640.
—— Prosser, London, 1770.
—— Richards, London, 1700.
J. and W. Richards, London, 1750.
Henry Rowland, London, 1632.*
R. Rowland, London, 1718.
Ryan & Watson, London, 1780.
—— Shirls, London, 1795.

John Smart, London, 1800.
L. Tanner, London, 1795.
—— Tatham, London, 1800.
E. Tilly, London, 1690.
Tow, London, 1789.
—— Twigg, London, 1782.
Truelock, London, 1667.
S. Turner, 1776.
John Watson, London, 1632.*
—— Wogdon, London, 1770.

a. Jos. Manton's patents were: April 18, 1792, form of cock; form of touch-hole. July 5, 1792, trigger spring; form, etc. of wooden wadding. July 6, 1803, pan and cock. September 15, 1806, elevated rib. April 30, 1812, lock, breech, musical trigger spring. February 22, 1816, firearm refinements. February 22, 1816, detonators. September 26, 1817, locks for detonators. August 3, 1818 primers. March 25, 1825 shot.

b. Henry Nock's patents were: April 8, 1775, safety and portable lock, not obstructing the sight, its priming secured against rain, removable from barrel, lever to set lock in motion, lock good for single and multi-barrel arms. April 25, 1787, improved form of breech. Nock made many ingenious arms which he did not patent, such as hammerless; hammer hung inside the lock plate, flint like Ames navy pistol percussion; multi-shot fowling-pieces, etc.

BIRMINGHAM

Jacob Austin, Birmingham, 1689.
William Bourne, Birmingham, 1689.

T. Ketland, Birmingham, before 1750 to 1791. Thos. and Wm. Ketland, Birmingham, 1803. Ketland & Walker, Birmingham, 1805. Ketland & Izon, Birmingham, 1805. Wiliam Ketland & Co., Birmingham, 1808. Ketland, Walker & Co., Birmingham, 1808–15. William Ketland & Co., Birmingham, 1815–18. Ketland, Walker, Adams, Birmingham, 1818. Wm. Ketland & Co., Birmingham, 1823–29.	As given by old Birmingham directories. All these Ketlands specialized on the American trade.

Tho. Moore, Birmingham, 1689.

—— Sharpe, Birmingham, 1730.
John West, Birmingham, 1689.
Richard Weston, Birmingham, 1689.
—— Willets, Birmingham, 1769.

OTHER ENGLISH GUN MAKERS BEFORE 1800

Thomas Addison, location unknown, 1692.
Samuel Bentham, location unknown, 1791.
Richard Blight, location unknown, 1779.
Charles Byrne, location unknown, 1772.
Charles Cardiff, location unknown, 1682; patented superposed loads in single barrel.
Isaac de la Chaumette, location unknown, 1721.
—— Clemson, Salop, 1740.
—— Collins, location unknown, 1762.
William Dupe, location unknown, 1798.
—— Galton, location unknown, 1759.
Thomas Gill, location unknown, 1800.
—— Grice, location unknown, 1759.
—— Hawkins, location unknown, 1776.
Jordan, London or Birmingham (?), 1733–1760.
Nathaniel Nye, Worcester, 1649–60.
—— Newton, Grantham, 1776.
F. Page, Norwich, 1776.
R. Parret, Salisbury, 1760.
—— Price, location unknown, 1762.
James Puckle, location unknown, 1718.
Henry Radoe, Norwich, 1585; making snaphances then.
Arnold Rotsipen, location unknown, 1628.
—— Toldan, location unknown, 1745.
Vaughan, location unknown, 1744.
—— Vernon, location unknown, 1761.
John Waters, location unknown, 1781.
Richard Webb, location unknown, 1795.

James Wilson, location unknown, 1792.
Thomas Wright, location unknown, 1772.

FRANCE

PARIS

—— Allevin, Paris, 1750.
—— Barrois, Paris, 1790.
Pierre, Baroy, Paris, *d.* 1780.
—— Bouillet, Paris, 1795.
—— Chasteau, Paris, 1690.
Jean le Clerc, Paris, *d.* 1739. Celebrated.
Nicholas le Clerc, Paris, 1780. Maker to Louis 16th.
—— La Roche, Paris, 1730.
—— Lenormand, Paris, 1800.
—— Mazellier, Paris, 1730.
—— Pauly, Paris, 1800.
—— Tanguay, Paris, 1730.
—— De Thuraine, Paris, 1740.

OTHER FRENCH GUN MAKERS BEFORE 1800.

—— Bouillet frères, St. Étienne, 1740.
—— Boutet, Versailles, 1790; maker to Napoleon 1st.
—— Marchan, Grenoble, 1750.
Jean Simonin, Luneville, 1627.
Claude Thomas, Espinal, 1623.
Pieere Bevier, location unknown, 1620.
—— De Lapierre, location unknown, 1650.
—— Gabrielle, location unknown, 1650.
D. Jumeau, location unknown, 1625.
—— Le Conte, location unknown, 1650.
—— Ponsin, location unknown, 1715.
Jean Renier, location unknown, 1750.

ITALY

Fra^co Caponato Batt, Brescia, 1680.

—— Borselli, Rome, 1600.

—— Bossi, Rome, 1623.

Lazarino Cominazzo, Brescia, about 1650 to 1690. Very celebrated.

Lazarino Cominazo, son, Brescia, about 1680–1720. Very celebrated. (Cominaco, Cominazzi, Cominazzo, other ancient spellings of same name.)

Bartoy Bon Fadino, Brescia, 1650.

Gio Batt Francino, Brescia, 1650.

Aqua Fresca, Borgia, 1694.

—— Johandi, Brescia, 1780.

Lazaro Lazarino (sometimes spelled Laro Lino), Brescia, 1650.

Lazoro Lazaroni, Venice, 1640.

Filippo Negroli, Milan, 1525.

—— Postindol, Spezzia, 1780.

Camillio Vitelli, Pistoja, 1540.

OTHER ITALIAN GUN MAKERS BEFORE 1800

Matteo Badile, location unknown, 1650.

—— Berselli, location unknown, 1650.

Antonio Bonisolo, location unknown, 1650.

Domenico Bonomino, location unknown, 1690.

Ventura Cani, location unknown, 1650.

—— Colombo, location unknown, 1650.

—— Cotel, location unknown, 1650.

Bartolomeo Cotel, location unknown, 1740.

Joseph Domineo, location unknown, 1750.

—— Giocatane, location unknown, 1650.

Michel Langrenus, location unknown, 1640.

Geronomio Motto or Mutto, location unknown, 1750.

Stefano Scioli, location unknown, 1680.
Antonio Venazolo, location unknown, 1670.

THE NETHERLANDS

Georg Alt, Liège, 1666.
—— Gathay, Liège, 1740.
Guillaume Grevin, Liège, 1568.
Cleode Hiquet, Liège, 1690.
Jacobus Van Oppy, Anvers, 1660.
—— Ortel Amsterdam, 1800.
Facka Speger, 1750.
N. Thomson, Rotterdam, 1780.

POLAND

C. L. Gibenhan, Warsowe, 1783.
—— Gung, Warsowe, 1800.
—— Utter, Warsowe, 1759.

BOHEMIA

Leopold Eckhard, Prague, 1800.
—— Libeda, Prague, 1800.
Marius Linck, Prague, 1660.

SWITZERLAND

Zell Blazi, 1614.
—— Frorrer, Winterthur, 1790.
—— Husbaum, Berne, 1790.
—— Michel, 1790.
—— Pauly, Geneva, 1800.
—— Riegel, Zweibrücken, 1750.
—— Stranglé, 1790.
—— Wys, Zurich, *d.* 1788.

GERMAN AND AUSTRIAN, EARLY

Leonhardies Bieslinger, Wien, 1687.
—— Boest der Junger, 1569.
Hans Breiten, 1666.
I. Georg Dax, Munchen, 1625.
Hans Heinrich Deiler, Frankford, 1663.
Daniel Eck, Nordlingen, 1668.
—— Engelking, Hanover, 1762.
—— Erttel, Dresden, 1624.
—— Glasonder, Utricht, 1690.
—— Guter, Nuremberg, 1560.
Joseph Hamerl, Wien, 1600.
—— Hansierg, Fos, 1699.
Andreas Hauer, Wurtzburg, 1650.
Daniel Heischaupe, Ulm, 1750.
Georg Hoch, 1654.
Stephan Klett, Suhl, 1586.
Gaspard Kollner, Wien, 1450.
Augustinus Kolter, 1616.
—— Kolbe, 1760.
Augustus Kotter, Nuremburg, 1520.
B. J. Kuchenreuter, Regensburg, 1700.
J. A. Kuchenreuter, 1740.
J. Chri. Kuchenreuter, 1740.
H. Nic. Markloff, Hanau, 1680.
Felix Meier, Wien, 1700.
C. Nuterisch, Wien, 1740.
Claus Reitz, Suhl, 1586.
Jan Sander, Hanover, 1669.
Adam Schnepz, 1670.
—— Schreiber, Halle, 1760–69.
—— Segmont, Klet, 1650.
Ich. Sommer, Bamberg, 1685.

Hans Jacob Stumpf, Mossbrun, 1682.
Ich Ulrich Tilemann, Marburg, 1676.
—— Valentin, Suhl, 1586.
C. G. Werner, Leipsic, 1750–80.
Jos. Fro. Wirth, Wien, 1750.
Marcus Zelner, Wien, 1580.
Killian Zollner, Salzburg, 1620.

GERMAN AND AUSTRIAN

(Approximately 1770–1800 or later)

Heinrich Albrecht, Darmstadt.
J. Albrich, Mantz.
—— Anschütz, Suhl.
—— Argens, Stuttgard.
David Arnth, Mergentheim.
V. Bartholomae, Potsdam.
—— Baumann, Villingen.
—— Behr, Wallenstein.
—— Bergh.
—— Bergsträsser.
—— Brenneck.
—— Calvis, Spandau.
—— Claus, Halberstadt.
Joseph Contriner, Vienna.
Cornelius Coster.
Pierre Cot, Vienna.
—— Dinkel, Hall.
S. Dison.
—— Echl, 1st, 2nd 3d, Berlin.
—— Elbert, Sondershausen.
J. M. Felber, Ravensberg.
Martin Fischer, Suhl.
Christoph Wilhelm Freund, Fürstenau.

Carl Freund, Fürstenau.
—— Fremmery, Berlin.
—— Friedler, Ulm.
J. Georg, Stuttgard.
—— Giverde, Strasburg.
J. C. Gorgas, Ballenstadt.
—— Gotteschalk, Ballenstadt.
Jean Grenet, Perleberg.
—— Harg, Cranach.
—— Hauser, Wurtzburg.
—— Heber, Carlsbad.
Christ. Hirsch.
—— Jach, Speier.
F. Jaiedtel, Vienna.
—— Junker, Crambach.
G. Kalb.
H. H. Kappe.
—— Kauffmann.
George Kayser, Vienna.
—— Kemmerer, Thorn.
—— Kleinschmidt, Wisterberg.
J. C. Klett, Pottsdam.
—— Knopf, Salzthal.
Georg Koint.
—— Krawinsky, Posen.
—— Kruger, Ratibor.
J. Lammerer, Cranach.
—— Lichtenfels, Carlsruhe.
—— Van der Lippe, Stettin.
—— Lippert, Cöthen.
—— Marter, Cologne.
Damien Marter, Bonn.
—— Mathe, Manheim.
—— May, Manheim.

—— Müller, Bernberg.
Müller, Steinau
—— Naumann, Cassel.
Joh. Neureuter, Saltzburg. Very famous.
—— Nordmann, Berlin.
—— Ortel, Dresden, and Amsterdam.
M. Oit, Wiesbaden.
—— Otto, Brandenburg.
—— Pfaff, Carsel.
—— Pfaff, Posen.
—— Pistor, Schmalkalden.
A. Potzi, Carlsbad.
—— Polz, Carlsbad.
—— Presselmeyer, Vienna.
—— Quade, Vienna.
—— Rasch, Brunswick.
Georg Reck (1769–82).
David Reme.
C. Rener.
Manfried Reichert.
—— Rewer, Dresden.
J. And. Rechold, Dorp.
Joh. Rischer, Spandau.
J. Roscher, Carlsbad.
Peter Saeter, Lemgo; in Lippe-Detmold.
—— Schackau, Bamberg.
—— Schedel, Stuttgardt.
—— Schirrman, Basewalk.
—— Schneevoigt, Baden.
Schramm, Zelle.
Fr. Schulze, Breslau.
—— Spaldeck, Vienna.
—— Stack.
—— Stark, Vienna.

Stephan Stockman, Potsdam; *d.* 1782.
—— Tanner, Cöthen.
—— Theiss, Nuremburg.
—— Töll, Sahl.
Ulrich, Eberndorf.
Christian Voigt, Altburg.
J. Jos. Vett.
—— Waas, Bamberg.
—— Walster, Saarbruck.
M. Wertschagen, Willingen.
Jean, Zergh.
—— Zurich, Vienna.

NAMES, INITIALS, AND DATES; LOCATIONS UNKNOWN

Taken from Demmin.

Michael Buxbaum, 1680.
Leon Georg Dax, 1690.
Johann Gutzinger, 1667.
Johan Georg, Hoffman, 1610.
Heinrich Keimer, 1691.
Hieronimus Léger, 1632.
Johann Martin, 1684.
Matheus Matl., 1661.
Bernard Ontner, 1630.
Stanislaus Paczelt, 1738.
Paul Poser, 1680.
Andreas Prantner, 1675.
Simon Rueff, 1689.
Johann Seitel, 1704.
Deitrich Veban, 1668.
A. Wasungen, 1690.

NAMES, INITIALS, AND DATES, LOCATIONS UNKNOWN

Taken from Demmin

CUT LETTERS

H. F.	1638
J. K.	1629
S. W. V. P.	1597
T. P. C. D. G. E. B.	1702

RAISED LETTERS

H. K.	1520
I. and W.	1550
M. W.	1550
F. L. F. H. V. Z. Z.	1550
P. O. V. G.	1590
H. C. R.	1600
P. V.	1678

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Geschichte der Handfeuerwaffen, Schon.

Notes sur un Pistolet Ecossais, Georges Stalin.

L'Arme à Feu Portative des Armées Francaises, Captain Bottet.
Monographies des Ouvriers des Canons de Fusil, Armand Julin.
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